

QST



August 1959

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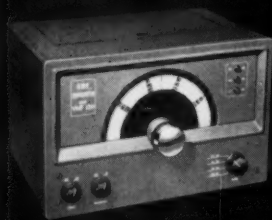
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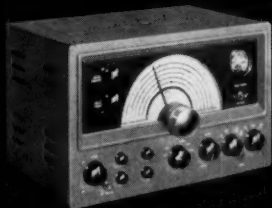
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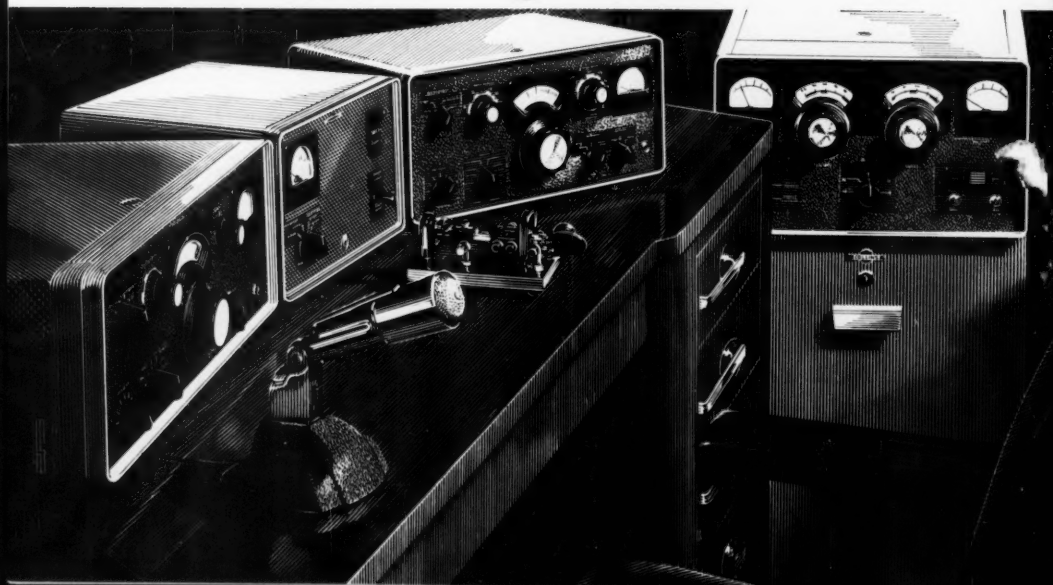
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QST

AUGUST 1959

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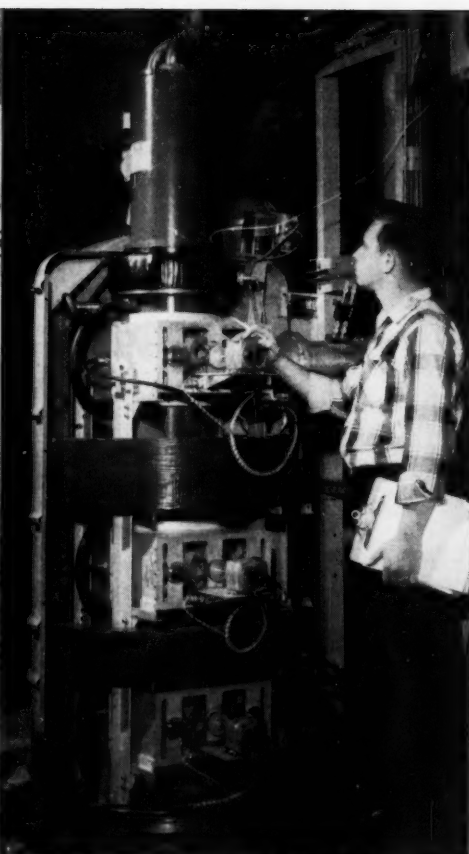
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Eimac Klystron final amplifier at Millstone Hill Radar site. M.I.T. Photo

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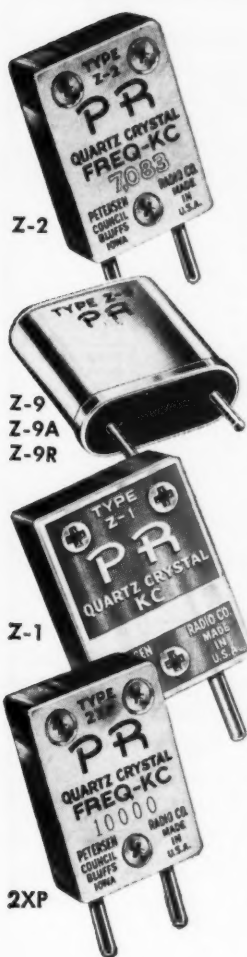
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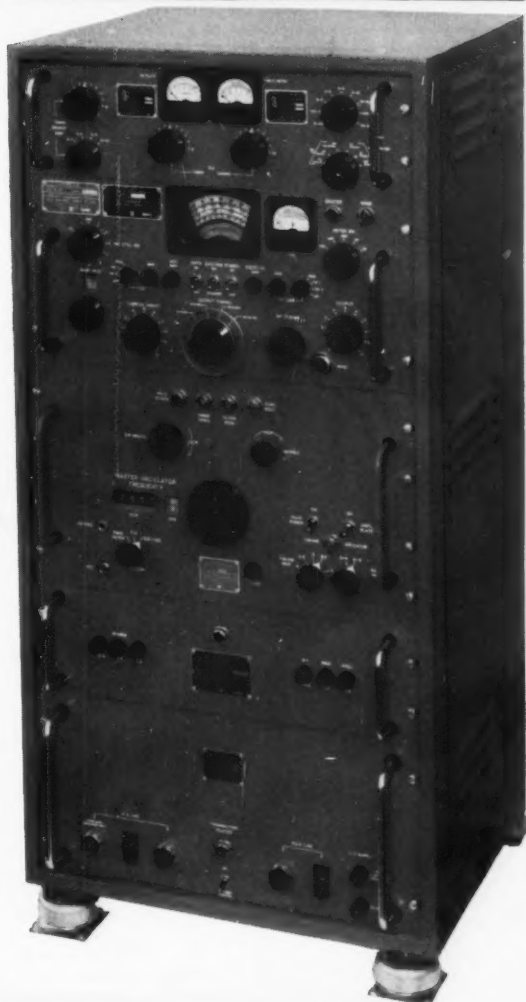
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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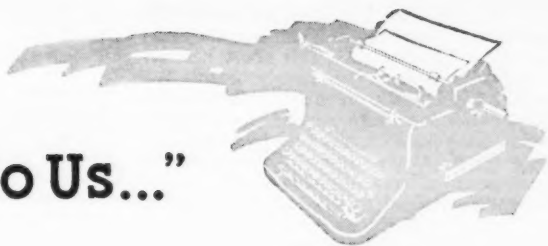
Southwestern Division

RAYMOND E. MEYERS, W6MLZ
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"It Seems to Us..."



GENEVA PROPOSALS

The first official word on the views of other countries toward possible changes in the world's regulations has now been published in the form of a "Book of Proposals" issued by the International Telecommunications Union. Unfortunately, several countries did not meet the publication deadline for filing their proposals and so the book — despite its bulk of two volumes and 869 pages — is not complete. However, with the specific caution that there may later be other proposals of concern to the amateur radio service, we can briefly summarize the highlights appearing in the first material received. We shall treat only proposals appearing to affect major amateur bands.

The band 3500-4000 kc. is not — and never has been — a worldwide amateur assignment. In the European-African area, only 3500-3800 is available to the amateur service at the discretion of national administrations, shared with fixed and mobile; in Asia-Oceania the figures are 3500-3900, on the same sharing basis. There are three proposals so far received to alter this arrangement. Australia wants to split the band with 3500-3700 for amateurs, the rest for fixed and mobile. India thinks a total of 10 kc. somewhere in the lower portion would be adequate for amateurs! Russia suggests that 3500-3650, still shared with fixed and mobile, would suffice. These proposals deal with regional allocations, we point out, and do not necessarily affect the status of the band in this portion of the world.

At 7 Mc., it is no surprise to learn that a number of countries — as at Cairo in 1938 and again at Atlantic City in 1947 — wish to expand broadcasting assignments at the expense of our 40-meter band. Outside of North and South America, the exclusive amateur portion is currently, and has been for the past twelve years, only 7000-7100 (50 kc. more in South Africa); 7100-7150 is theoretically shared between amateur and broadcasting but practically of no amateur use, and the top half is broadcasting exclusively. For the Geneva conference, Australia, Belgium, France, India, Italy, Japan, Netherlands, Poland and the U.S.S.R. have all indicated their intentions of either (1) bringing North and South America under the sharing arrangement existing elsewhere or (2) at least deleting 7100-7150 kc. sharing in their areas.

Australia and India are the only countries so far whose proposals impinge on 14 Megs. Australia would cut off the top 100 kc., and India would take 50 kc. more, both arguing that the fixed service badly needs more space in this portion of the spectrum.

No country, so far, proposes any change at 15 meters.

For 28 Mc. Australia, after taking potshots at lower frequency bands as mentioned above, proposes to put us back at 28-30 Mc! A coalition of France, Belgium, Italy and the Netherlands, however, wants to cut the amateur band to 28-29, with the rest for fixed, and Japan would like to use the top portion for fixed in its own country only.

Higher frequencies are largely regional in nature, of course, and so far no proposal has been published which looks ominous, though a number of suggestions have come forward for rearrangement of microwave bands, including ours. In non-allocations matters there are a few proposals for minor amendments of Article 42 dealing with the amateur service, but none of serious practical import to us.

It is impossible to sum up at present what all this means; the material is simply not sufficiently complete. Also, let us point out again that these are merely the initial proposals of the countries concerned, as part of the specified routine preliminary conference procedure we have been through many times before, and they may or may not get any measure of support at the conference itself. But perhaps by next month's issue deadline we shall have supplementary material from enough additional countries to present a reasonably complete summary.

By the time that (September) issue reaches you, the League's delegation will have left for Geneva, but we'll have regular reports in each subsequent issue and of course special interim communiques to the ARRL Board of Directors if developments warrant.

EXTRA CLASS STATUS

Ever since the Federal Communications Commission abolished the requirements of an advanced grade of amateur license as a condition to use of certain bands with voice emission (an action which the League vigorously — but unsuccessfully — opposed), the ARRL

(Continued on next page)

Board of Directors has attempted to rebuild some sort of incentive program into the amateur licensing structure. This effort has not borne fruit. Perhaps it is largely because the incentive to upgrade one's ability for the purpose of attaining a higher class of license must, in practice, consist of additional privileges; and since by the Commission's earlier action all privileges were made available to all amateurs (except Novice and Technician), this approach would have required withdrawing certain operating privileges from a considerable number of amateurs, and was therefore felt to be impracticable.

All this time the Amateur Extra Class license has existed in the Commission's rules but, being of little more use than a certificate of merit, it has received practically no attention from the amateur body. Apparently similarly concerned with the situation, FCC has now issued a Notice of Inquiry reproduced on page 67 of this issue, which solicits suggestions as to how our rules might be changed so as to make the Amateur Extra Class license one of more meaning and prestige. The Commission is receptive to any idea on the subject except one which, as stated in the Notice, it has considered before and rejected. The deadline for comment is September 15.



(See page 63)

COMING A.R.R.L. CONVENTIONS

August 15-16 — Pacific Div., Honolulu
 August 22-23 — Central-Midwest Divisions, St. Louis, Mo.
 September 5-6 — N. E. Division, Hartford
 Sept. 5-7 — Maritime Province, Halifax, Nova Scotia
 October 3-4 — Roanoke Division, Richmond, Va.
 Oct. 17-18 — Ontario Province, London, Ontario

OUR COVER

The red banner across the cover of this month's issue calls attention to an important milestone in amateur pioneering. For further details, see W1HDQ's report on page 68. Incidentally, since Ed wrote his report, KH6UK and W6NLZ did it again, on June 30, and this time KH6UK was also heard by W6WSQ. The antenna on the cover is KH6UK's. Our lead story (eyes right) describes a parametric amplifier that was in use on these California-Hawaii tests.

CENTRAL-MIDWEST DIVISION CONVENTION

St. Louis, Missouri — August 22-23

A combined Central-Midwest Division ARRL Convention will be held in St. Louis, Missouri, Saturday and Sunday, August 22-23. The Chase Hotel, across from Forest Park, is convention headquarters. The hidden transmitter hunt and radio control demonstration will take place in Forest Park. The Convention is sponsored by the radio clubs of the Greater St. Louis area, with clubs in Missouri and Illinois participating.

The Convention begins on Saturday, August 22, with registration at 8 A.M. and a general assembly set for 1 P.M. A full schedule of meetings is planned to include DX, traffic, SSB, VHF, RTTY, MARS, RACES and YLRL. A Wouff Hong Initiation will be held midnight Saturday. FCC amateur exams are scheduled all day Friday, August 21, and 9 A.M. to 1 P.M. Saturday.

Among the personalities will be Goodwin L. Dosland, W0TSN, President, ARRL; George Hart, W1NJM, National Emergency Coordinator, ARRL; Lt. General Francis H. (Butch) Griswold, K0DWC, Vice Commander-In-Chief, Strategic Air Command; John G. Doyle, W9GPI, ARRL Director, Central Division; Robert W. Denniston, W0NWX, ARRL Director, Midwest Division; C. E. Dewey, W8BLM, Deputy Director, Communications Office of Civil Defense Mobilization; B. C. Simpson, RMC, K9BKS; W. C. Campbell, and W. B. Wright, K9KND.

Bud Drobish, W9QVA, will discuss his experiences in the operation of communication gear, including equipment aboard the MATS aircraft "Operation World-Wide" using W8OLJ.

The convention committee urges hams to bring the whole family — baby sitters and a nursery will be available.

Pre-registration, by mail, including the Saturday night banquet and a Sunday luncheon, will be \$10.50, without meals, \$4.00. Hotel Convention registration only, is \$5.00, and with banquet and luncheon tickets, \$12.50. Pre-registration deadline is August 7. Send Convention registrations to The Amateur Radio Convention Committee, Inc., 317 North Meramec, St. Louis 5, Missouri.

NEW ENGLAND DIVISION CONVENTION

Hartford, Connecticut — September 5-6

The Hartford County Amateur Radio Association will present the first convention in Hartford in more than 20 years. Labor Day week end, Sept. 5 and 6. Many special features are being planned to make this a memorable affair. Festivities will get underway with an informal pre-convention party Friday night, to be followed by two days of general sessions, special-interest luncheons and breakfasts, contests, technical programs, transmitter hunts, FCC exams, a Saturday-night party and a grand banquet

(Continued on page 158)

The projects W6AJF describes here were undertaken at a time when little or no practical information was available that would enable an amateur to build working models of these new devices. The reader, on the other hand, has the benefit of the work of Bateman and Bain, detailed in a four-part series in December, 1958, through March, 1959, QST, to help him understand what early-bird W6AJF had to find out for himself. A careful reading of the articles by W4AO and W4LTU is recommended as preparation for this one, particularly to the newcomer to the parametric-amplifier field.

Working Toward Lower Noise

Figures in Reception at

144, 220 and 420 Mc.

BY FRANK C. JONES,* W6AJF

Experimental Parametric Amplifiers

LIKE many other amateurs who have made a specialty of long-distance v.h.f. and u.h.f. work, the writer was extremely interested when news of the parametric, mavar or reactance amplifiers began to appear in print. But like other amateurs (and most of the professionals, too) we had only vague notions of how to put the new devices to practical use. After many hours of experimental work with a varactor diode from Microwave Associates, practical ideas began to emerge.

Many days were wasted in some of the early tests, as almost no experimental information was available. Learning about these new techniques had to be done the hard way, at the expense of much sheet metal, broken plunger-type trimmers, coax fittings and even one varactor diode. This cost of being early in a new field was well worth the effort, however, for at this writing we have one good amplifier on 144 Mc., a better one on 220 Mc., and a couple of good 432-Mc. units. Further work on 432 Mc. and a 1296-Mc. project are planned.

Some Preliminary Findings

Lowest noise figures and best amplification were obtained with a varactor diode in an amplifier, rather than an up-converter. Tests

were made at 144 Mc. with up-conversion to 432 and 1296 Mc. The 432- and 1296-Mc. receivers had noise figures of 4 to 5 and 8 to 10 db., respectively. This deteriorated the over-all noise figure with the up-converter, so the final result at 144 Mc. was never below 2 db. Since a noise figure of $2\frac{1}{2}$ to 3 db. was already available with several good 2-meter converters using tube amplifiers, the up-converter didn't offer much improvement. The up-converter arrangement had the added disadvantage of requiring a highly stable pump power source.

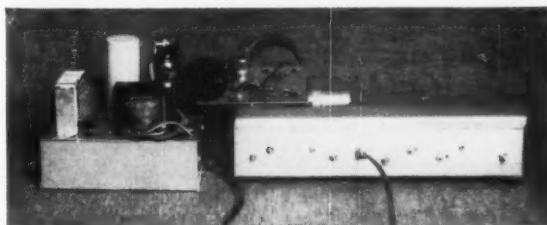
On the other hand, a straight-through parametric amplifier apparently gets down under 1 db. at 144 and 220 Mc., and the pump stability requirement is not nearly so severe as with the up-converter. The up-converter is not as regenerative as the amplifier, and it seems to depend for its over-all signal gain on the extent to which the signal frequency is up-converted. A 1296-Mc. receiver gives more gain from a 144-Mc. up-converter than does a 432-Mc. receiver and, despite the higher noise figure of the 1296-Mc. receiver, the over-all noise figure is about the same.

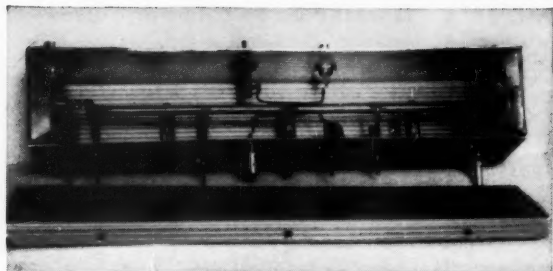
The over-all noise figure of an up-converter system is given by

$$F = F_1 + \frac{F_2 - 1}{G_1}$$

* 850 Donner Ave., Sonoma, Calif.

The 220-Mc. parametric amplifier ready for use at W6AJF. Regulated power supply, left, is for the pump oscillator, in the small box at the rear.





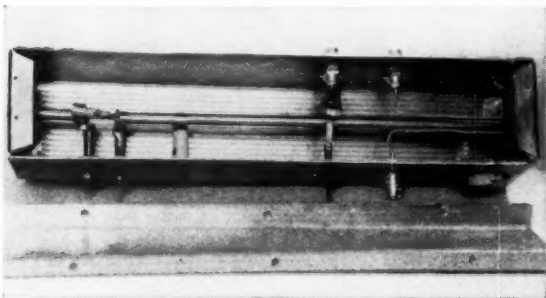
Interior of the 220-Mc. amplifier, with the varactor and short pump line at the far left. Signal input and output coupling loops are the center of the line. Note that the half-wave line, used in the 220- and 432-Mc. amplifiers, is mounted on insulating standoffs.

where F_1 is the numerical value of up-converter noise figure, F_2 is that of the receiver used as the i.f. system, and G_1 is the gain of the up-converter or amplifier, as the case may be.

One down-converter was built, with a varactor diode and pump oscillator, but it showed a loss in gain and a poor noise figure, when compared to the up-converter system. Further up-converter tests are planned here in the near future.

One That Didn't Work — And Why

The first parametric amplifier for 144 Mc. built here used a silver-plated coaxial line, with a $\frac{3}{4}$ -inch inner conductor and a $1\frac{3}{4}$ -inch outer conductor, about 12 inches long, shorted at one end. A small tuning capacitor and the varactor diode were connected from the open end of the inner conductor to the grounded shell, with a blocking capacitor in series with the diode. A variable oscillator covering 250 to 350 Mc. was used as the pump, with a regulated plate supply, variable from 0 to 90 volts. The best pump frequency within the above range was around 285 Mc. Pump energy was fed in through a tap on the line about one inch from the grounded end. Coupling loops for the 144-Mc. input and output were about 3 inches long, mounted close to the inner conductor and series tuned with small trimmers. Moderately good noise figure was indicated, but the unit was unstable and very difficult to maintain in operation. Because one idler frequency was close to the signal frequency the amplifier was very ineffective in the presence of auto ignition, line noise or other external interference, and the system responded to signals on the idler frequency nearly as well as to the desired ones.



The 144-Mc. amplifier uses a quarter-wave line, with the inner conductor grounded at the right end. Pump line and varactor are at the left, with signal input and output coupling at the right end.

These limitations seemed to eliminate as undesirable the only type of circuit that had been mentioned in amateur literature up to that time. At 432 and 1296 Mc. this image effect might not be troublesome, as external noise is far lower there, and amateur QRM is not much of a problem.¹ On 144 or 220 Mc., however, on-the-air results were very disappointing, and the design was of little use, other than to gain experience.

Practical Working Models

Then followed a long period of paper and sheet-metal work on parametric amplifiers for 144 and 220 Mc. The idea of a cylindrical coaxial tank was abandoned, as a line built into a long box of square cross section would serve equally well and, if made with a removable side, would be much more readily worked on. The line impedance should be known for working out practical dimensions. The impedance of a cylindrical coaxial line is found from the formula

$$Z = 138 \log_{10} \frac{D}{d}$$

The impedance of a line built in a long box with sides equal to the diameter of a cylindrical line has an impedance 10 to 15 per cent higher. Use of a $\frac{1}{4}$ -inch inner conductor in a box $2\frac{1}{4}$ inches square results in a line impedance of about 140 ohms. Boxes 12 inches long and $2\frac{1}{4}$ inches square were used in the 144- and 220-Mc. amplifiers described herewith.

¹ Bateman and Bain pointed out in March *QST* that use of a pump frequency of twice the signal frequency fundamentally limits the over-all noise figure to no lower than 3 db., though noise figure measurements may make it appear that much lower noise figure is being achieved.—Ed.

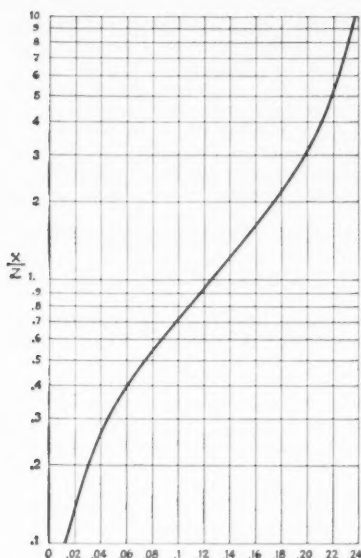


Fig. 1—Curve showing normalized input reactance $\left(\frac{X}{Z}\right)$ versus length in wavelengths of short-circuited coaxial or parallel-line circuits. X is the inductive reactance of the line and Z is the characteristic impedance.

Four frequencies are involved in the operation of the parametric amplifier: the signal frequency, the pump frequency and two idler frequencies. The idler frequencies are equal to the sum and difference of the first two. The proper value of impedance for each frequency must be present for parametric amplification with a varactor diode.²

A typical amateur design for 220 Mc. will be described, since the procedure outlined gave reasonably good results when applied to actual construction. A line impedance of 140 ohms was chosen, as this could be made easily with available components, as mentioned above. As a starting point a pump oscillator frequency of 500 Mc. was used. The upper idler frequency was then 500 plus 220, or 720 Mc. The lower is 500 minus 220, or 280 Mc. By a process of elimination, the coaxial line circuit shown in Fig. 2 was arrived at.

A half-wave line was chosen for 220 Mc. as the two idler frequencies could be tuned more readily with this design. One or more tuning capacitors for the idler frequencies are placed across the line circuit at the grounded or zero-voltage point

for 220 Mc. These reflect smaller capacitances across the open ends of the line, so only a guess can be made of the net capacitance at the end.

The Microwave Associates MA-460A varactor diode had a "zero" capacitance marking of 6.6 μf . This plus 1 to 2 μf . from the small tuning capacitor gives about 8 μf . at the varactor end of the line.

The inductive reactance of the short pump-frequency line, in series with the diode capacitance to ground, cancels a small portion of the diode capacitive reactance. For this reason, the pump line should be short; perhaps an inch or so for 144- or 220-Mc. amplifiers. The receiver with which the amplifier is used must have enough selectivity at 220 Mc. to keep any 280- or 720-Mc. signals or noise from getting into the first mixer. A few slug-tuned circuits at 220 Mc. should accomplish this.

In Fig. 1 is shown a curve which gives the capacitive reactance, normalized to the characteristic impedance, required for resonance at the input terminals of a short-circuited transmission line, for lengths up to about one-quarter wavelength. If an open-circuited line with equal capacitance at each end is used, the length obtained from the curve of Fig. 1 must be multiplied by a factor of 2.

The wavelength in inches for any frequency can be calculated from the expression, $\frac{11,800}{f_{\text{mc}}}$, which gives figures of 53.5 inches for 220 Mc., 42 inches for 280 Mc., 23.6 inches for 500 Mc., and 16.4

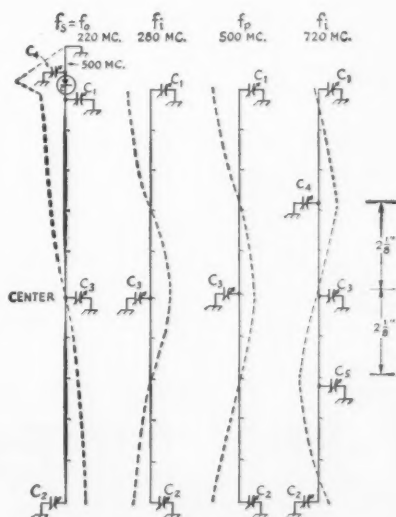


Fig. 2—Voltage distribution and tuning points on a 220-Mc. line 10 inches long, with a characteristic impedance of 140 ohms. Idler frequencies of 280 and 720 Mc. result from the use of a pump frequency of 500 Mc. and a signal frequency of 220 Mc.

²The author appears to have used a more complex approach than is necessary here. Theory and practice indicate that only the lower of the two idler frequencies need be considered in the design of a parametric amplifier. The relatively low pump frequencies used by W6AJF may account for the need for taking the upper idler frequency into account in his experience. — Ed.

inches for 720 Mc. For a capacitance of $8 \mu\text{f.}$ at each end of the line, the value of X at 220 Mc. is 84 ohms, at 280 Mc. 70 ohms, at 500 Mc. 40 ohms, and at 720 Mc. 28 ohms. Each of these divided

by 140 gives the $\frac{X}{Z}$ on the vertical scale of Fig. 1.

Reading the values of line length from the curve gives the length to a zero-voltage point from each end of the capacity-loaded circuit.

The actual values plotted in inches in Fig. 2 are obtained by multiplying the wavelength in inches for each frequency by the decimal values of Fig. 1. These were 5, 3.15, 1.0, and 0.82 inches, respectively, from each end, neglecting end effects. For resonance in the 220-Mc. band, this line would be approximately 10 inches long. To make Fig. 2, several vertical lines were drawn 10 inches long, or scaled into 10 equal parts. The relative voltage or impedance at 220 Mc. is shown as the dotted line with a null at the center. Tuning the line to 220 Mc. is done with a $3\text{-}\mu\text{f.}$ variable capacitor, C_1 , in parallel with the diode capacitance and, at the other end, by a $10\text{-}\mu\text{f.}$ capacitor, C_2 . The null can be set at the exact line center by running C_1 and C_2 in opposite directions when the coax line is being tested without a pump oscillator in preliminary alignment.

Next, consider 280 Mc., a proposed idler frequency. The null will be about 3 inches from each end of the 10-inch line, as shown in the second line of Fig. 2. To make the 4-inch middle section of the line become a shortened half-wave circuit at 280 Mc., capacitor C_3 can be added at the exact center without affecting the 220-Mc. circuit, if it is balanced properly. This value of C_3 can be calculated by the reverse process, using Fig. 1. The two 2-inch sections each side of the center are short-circuited lines

at 280 Mc., having a length of $\frac{2}{42} = 0.048\lambda$. From

Fig. 1, 0.048λ corresponds to an $\frac{X}{Z}$ value of 0.33,

and since $Z = 140$, $X = 140 \times .33 = 46$ ohms, or $12 \mu\text{f.}$ at 280 Mc. Actually, the reactance of C_3 is one-half this value since it is tuning two line sections in parallel so $C_3 = 24 \mu\text{f.}$

The same method can be used to calculate C_3 in the third line at 500 Mc. Obviously, the same value of C_3 cannot be used for both 500 and 280 Mc., so the 500-Mc. function is moved up to

the shorter line on the other side of the varactor, as shown at the top of the left-hand drawing in Fig. 2. A short line with a large tuning capacitance will offer enough impedance at the pump frequency to function by varying the pump oscillator power into this circuit. Either the lower idler frequency or the pump frequency can be moved to this short line, but in general it is better to put the oscillator into the short line. If this

line is about 1 inch long, $\frac{1}{23.6} = .045\lambda$. From

Fig. 1, $\frac{X}{Z} = 0.3$ and $X = 140 \times 0.3 = 42$ ohms.

C_4 is thus equal to $7.5 \mu\text{f.}$, including some capacitance through the varactor and the long circuit.

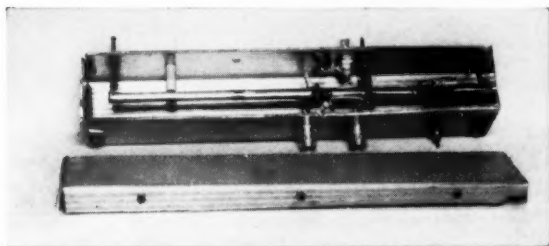
Consider the 720-Mc. idler frequency. The first null occurs about 0.8 inch in from each end of the 10-inch line. If it weren't for C_3 , which is needed for the other idler frequency, the line would be nearly resonant since there is approximately a half wavelength (8.2 inches at 720 Mc.) between these nulls on the 10-inch line. But the presence of C_3 makes it necessary to have a null at the center of the line so C_3 will have no effect at 720 Mc. Adding equal capacitances, C_4 and C_5 , at the correct points will tune the 10-inch line to 720 Mc. by multiple resonance. The distance from the end null to the center is $5 - 0.8 = 4.2$ inches, and half of this is $\frac{4.2}{2} = 2.1$ inches. This length represents

$\frac{2.1}{16.4} = 0.128\lambda$ and from Fig. 1, $\frac{X}{Z} = 1.0$. Thus,

$X = 140$ and $C = 1.6 \mu\text{f.}$ at 720 Mc. Doubling this value for C for tuning the two sections in parallel gives $C_4 = C_5 = 3.2 \mu\text{f.}$

The effects of C_4 and C_5 on C_1 and C_2 , and then on C_3 , can be calculated, and amount to a slight increase in the effective capacitance at C_1 and C_2 . Thus in tuning C_1 and C_2 their values would be set at about $\frac{1}{2} \mu\text{f.}$ less than originally calculated. C_4 and C_5 are physically so near the null points at 280 Mc. that C_3 would be only a tiny bit less than calculated.

All this looks fine but several factors have been neglected or their effects guessed at for simplification. All tuning capacitors and even the varactor have inductance in the leads or plungers. Fortunately, this effect is small enough so careful adjustment of all capacitors and variation of the



The 432-Mc. amplifier has the pump energy inserted near the center of the half-wave line. Idler tank and varactor are at the right of this photograph.

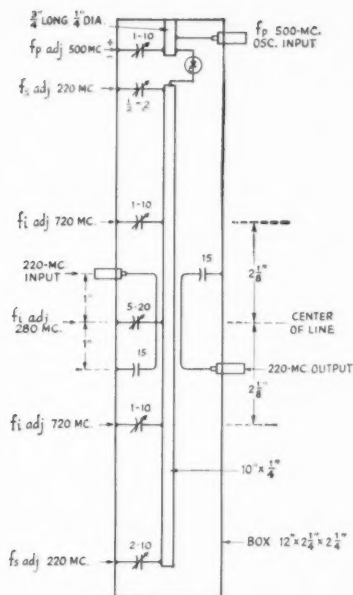


Fig. 3—Dimensions of the 220-Mc. parametric amplifier. The 220-Mc. tuned circuit is a half-wave line. Pump energy is fed into the short line at the top of the amplifier.

pump oscillator frequency will usually result in hitting the magic spot of proper amplification at low noise levels. If a high pump frequency such as 1000 to 1400 Mc. is used, the two idler frequencies also will be very high and the capacitor lead inductance will completely upset calculations. That is probably the reason why the 432-Mc. amplifier is still not completely satisfactory.

The dimensions of Fig. 3, based on the foregoing calculations, have been found to make a very good 220-Mc. amplifier. If the varactor "zero" capacitance is something more or less than 6 μf , the dimensions may have to be changed, since too much capacitance at C_1 which—in effect, is across the varactor—may prevent proper "pumping." More data and more varactor diodes of different capacitances will have to be tested to study this effect. It would seem desirable for the varactor capacitance to be around 4 to 6 or 7 μf for v.h.f. operation and 2 or 3 μf for u.h.f. bands. The 432-Mc. band is a little high in frequency for a 6- μf varactor and perhaps it would be easier to get a lower-capacitance unit into operation on this band.

The sketch in Fig. 3 gives the essential dimension and locations of capacitors for the 220-Mc. amplifier. Aluminum about $\frac{1}{16}$ -inch thick is suitable for the box if copper (heavy flashing sheet) is used for the end pieces. These should have bent-over lips on all four sides. The ends can be fastened into the aluminum sides with a couple of sheet-metal screws on each side. The $\frac{1}{4}$ -inch

diameter center conductor should be soldered into the sheet copper end pieces for the 144-Mc. unit. In the 220- and 432-Mc. units only one end needs to be copper since the half-wave line is floating free of ground on a pair of small poly or ceramic insulators.

Fig. 4 gives the dimensions found suitable for 144 Mc. with a 6- μf varactor. The dimensions in Fig. 5 for the 432-Mc. unit are for the same varactor diode. Miniature plate-type capacitors were used at first for tuning, but caused the circuit Q to drop too much. Later, copper solder lugs were made up to fit over the shafts to clamp against the box side, and then bent around for soldering to the ground lugs on the capacitors. The Q went back up and, since several of the glass piston-type trimmers which had been substituted had been broken due to carelessness, the little plate-type capacitors were put back into the 220- and 144-Mc. amplifiers.

Variable capacitors for the input and output links at 432 Mc. (near the center of the long line) were so large and space-wasting that very small 5- μf NPO fixed capacitors were used to tune out most of the link reactance at 432 Mc. Moving the 1-inch long insulated links (BNC coax fitting to 5- μf capacitor) closer to or farther away from the center line is necessary in getting the amplifier to fire up properly. Similarly at 220 Mc., fixed 15- μf ceramic capacitors (with minimum possible lead lengths) were finally used in series with the 2-inch links. At 144 Mc., two 30- μf capacitors were substituted for the 5- to 40- μf capacitors shown in the photograph of this amplifier. The links in this case were 3 inches long (including the capacitor). The 144-Mc. unit was modified as shown in Fig. 4 after the photographs were made.

Alignment Suggestions and Miscellaneous Notes

Alignment isn't easy unless one is lucky. Every tuning control reacts on the others, so a lot of patience and a diode noise generator are needed. The first step is to get a reference reading with the receiver connected directly to the noise generator. Then connect the parametric amplifier into the coax line between the noise generator and the receiver. Leave the pump oscillator turned off but have the varactor diode in place. (Handle it carefully!) Tune the end capacitors for best noise figure. If this is more than 20 per cent above the noise figure without the amplifier, adjust the input and output links also. Once you get the noise figure down near the original value, the signal circuit end tuning should be touched up slightly, because it is possible to get amplification off resonance and lose about 1 db. of noise figure. If the unit has a half-wave line, try to get it balanced up so a short circuit with a small screw driver to the box at the line center has no effect on the noise figure.

The next step is to turn on the pump oscillator and slowly increase its output. For safety, keep the oscillator input to less than one-half watt. The pump-circuit tuning and the idler-frequency

In the three units described here, two 6AF4 parallel-line oscillators are used. One has parallel $\frac{1}{4}$ -inch rods spaced less than $\frac{1}{4}$ inch edge to edge, with a small butterfly tuning capacitor at the end opposite the tube. Plate current is fed into the plate side through a 2000-ohm resistor at the center of the line, and a 10,000-ohm grid leak to ground connects to the other rod near its center. The tuning range is from about 700 to 830 Mc. The 425- to 550-Mc. oscillator has similar construction with 4-inch lines. These are not ideal, and a more mechanically and electrically stable oscillator for these ranges could be built with a heavy flat-plate line of lower impedance and greater physical length.

The 220-Mc. amplifier shows nearly 3 db. improvement over a 417A tube amplifier normally used on this band. The 144-Mc. unit shows from 1 to 2 db. improvement over a 417A tube amplifier. These improvements indicate that the parametric amplifiers are not far from a noise figure of 1 db. The 220-Mc. unit tuned up most readily with a pump frequency of 520 Mc. and the 144-Mc. unit with the pump at about 475 Mc. The pump frequencies may be changed a few megacycles without ill effects if the idler adjustments are varied. These frequencies apply only to these particular units with the one varactor used in all three.

In some recent tests on the 144-Mc. amplifier for spurious output the pump frequency was set at 482 Mc. and the adjustments made for

⁴ Better results could be obtained with a higher pump frequency. Something of the order of 1500 Mc. or higher is recommended for use with 432 Mc. amplifiers.

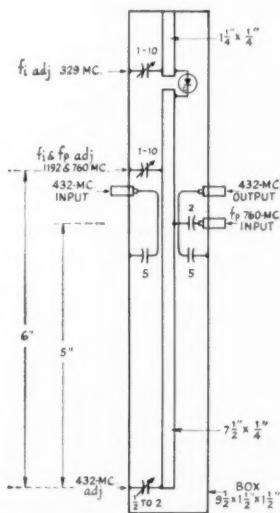


Fig. 5—Dimensions of the 432-Mc. amplifier, using half-wave tank circuit. Varactor mounting is similar to that used in the 220-Mc. amplifier.

Front panel layout. Controls along the bottom from left to right: grid-tuning capacitor, grid band switch, meter switch, switch for fixed output capacitors (coarse loading), variable output capacitor (fine loading). The large dial in the center drives the rotary inductor, while the large knob (Millen 10008) turns the plate tank capacitor.

180 Watts C. W. —

130 Watts Phone

BY FRED F. REED,* K2RHG



6146s in Parallel

For some time, our correspondence has indicated more interest in transmitters running a power input of about 150 watts than those of any other input rating. This clean-cut straightforward job should be a popular item.

THE amplifier shown in the photographs uses a pair of 6146 tubes in parallel and is designed to cover all amateur bands from 3.5 to 30 Mc. It can be operated at a maximum input of 180 watts on c.w. or 130 watts on phone. It may also be operated linear, Class AB₁, for s.s.b. operation.

Circuit Details

The input circuit is a parallel-tuned tank linked to the driver. Two separate coils are used in the grid circuit. They are used in series on 80 and 40 meters, while on 20 meters and higher one coil is entirely shorted out, as well as the required number of turns on the other coil, to obtain correct tuning of the circuit. The low-frequency link is also shorted out on all bands above 7 Mc. in

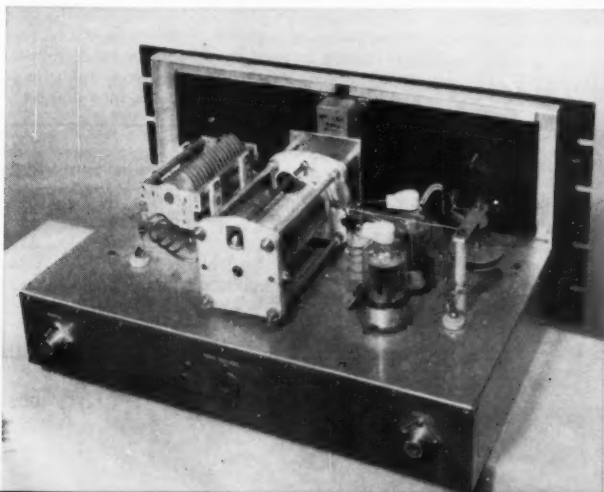
order to avoid difficulty in obtaining sufficient grid drive. The entire circuit is tuned by a 100- μ fd. variable capacitor, C_1 .

The unit is neutralized by the capacitive-bridge method, while the combinations of L_5R_1 and L_6R_2 are adjusted to suppress any v.h.f. parasitic oscillation.

The rotary inductor (L_8) used in the pi-network output circuit came from a surplus antenatuning unit and has a value of approximately 10 microhenrys; however, a Johnson type 229-201 inductor will work just as well and requires less space. The rotary inductor is used on all bands except 10 meters where a separate coil (L_7) is used.

The required value of output capacitance is obtained from a three-gang, 365- μ fd.-per-section broadcast-type variable, C_4 , with all sections connected in parallel. This capacitor is supplemented by two 400- μ fd. fixed capacitors, C_5 and C_6 , to give a total of approximately 1900 μ fd.

The meter used in this unit reads 1.5 ma. full scale. It is shunted to give full-scale readings of 15 ma. in the GRID position of the meter switch, 30 ma. in the SCREEN position, and 300 ma. in the PLATE position. Any meter with a full-scale reading of about 1 ma. may be used. Shunts are wound with copper wire following the procedure outlined



Rear view of amplifier. The shafts of the tuning capacitor and rotary inductor are spaced $3\frac{1}{2}$ and $8\frac{1}{2}$ inches from the left side of chassis. The 10-meter coil can be seen behind the tuning capacitor. The 6146 sockets are spaced $3\frac{1}{2}$ and 6 inches in from the back of the chassis and $4\frac{1}{4}$ inches in from the right side. The neutralizing capacitor and r.f. choke are mounted in a line centered between the 6146 sockets.

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$\frac{1}{2}$ -inch standoff insulator, and the rotor is turned through an insulated shaft coupling. The neutralizing capacitor used was a home-brew unit having a maximum capacitance of about 10 μf . It is sketched in Fig. 2. However, any commercial unit having about the same capacitance, such as the Hammarlund NZ-10, will work just as well.

The meter switch shown in the photographs has ceramic insulation, but a switch with phenolic insulation will serve the purpose adequately, and such a unit is specified in the parts list.

The rotary inductor is mounted centrally on the chassis and is driven through a counter dial. The dial pictured is a Millen unit that was obtained on the local surplus market. A counter dial such as the Groth type would, no doubt, require less space and be easier to mount. The plate tuning capacitor is mounted on the panel at the same height as the inductor shaft to preserve symmetry. All paint on the panel, where any mechanical joint is to be made, should be removed to insure good electrical contact.

The output capacitor and the switch for the fixed capacitors are mounted beneath the chassis with the same panel height and spacing as the grid-tank components.

To complete the shielding, the chassis is fitted with a bottom plate and a cover made from Reynolds perforated stock.

Adjustment and Operation

Before applying excitation the amplifier should be checked for parasitic oscillation by following the procedure outlined in the *Handbook*.

The amplifier should then be neutralized. To do this, tune the grid and plate circuits to resonance in the 10-meter band. Plate and screen voltages should be disconnected and grid drive applied to give rated grid current. The meter is set to read grid current and the neutralizing capacitor adjusted until a setting is found where there is no kick in grid current when the plate capacitor is tuned through resonance.

The various operating voltages for all classes of operation are given in the following table:

The grid bias for Class C operation may be supplied from an external fixed supply, a grid-leak resistor, or a combination of both. The bias for Class AB₁ should come from a fixed supply. It should be remembered that when this unit is used on c.w. it is not keyed and therefore some method of limiting the plate power input to under 50 watts during key-up conditions should be provided. This can be done by using separate

Under-chassis view of amplifier. Grid-tank components are in upper left, output capacitors in upper right. The grid tank-capacitor shaft and the output-capacitor shaft are approximately $\frac{1}{2}$ inches in from edge of chassis, while the shafts in the grid-tank and output circuits are spaced about 2 inches. The meter switch is in the center. Connections from output coils and neutralizing capacitor are brought through the chassis with feed-through insulators. Clustered around the power socket in lower center are the v.h.f. chokes and bypass capacitors.

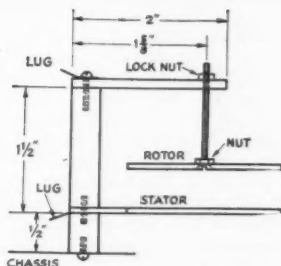
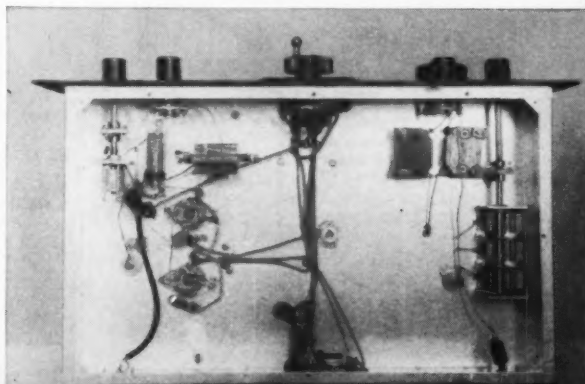


Fig. 2—Sketch showing constructional details of the neutralizing capacitor. The plates are identical 2-inch disks of $\frac{1}{16}$ -inch aluminum, except that the stationary plate has a mounting ear at one side and the rotary plate is drilled and countersunk at the center for a 2-inch flathead 6-32 screw. The head is peened to keep it flush with the disk. The insulating support is two ceramic standoff insulators, joined by a piece of threaded rod with the ear of the stationary plate sandwiched in between. The rotor support is a strip of $\frac{1}{8}$ -inch aluminum, threaded for the rotor screw.

fixed supplies for grid bias and screen voltage or, if the screen voltage is taken from the plate supply through a resistor, and grid bias supplied from a grid-leak resistor, a clamp-tube circuit may be used. For phone operation the screen voltage should be obtained from the plate supply through a dropping resistor.

A grid-dip meter is useful for initial tune-up. For 80 meters the plate tank capacitor should be set to almost maximum capacitance and the rotary inductor adjusted for resonance. The setting of the inductor should then be logged for reference. On 40 meters the capacitor is set to one half its maximum value and the same procedure followed. On 20 meters the capacitor is set so that the plates are only slightly meshed, and on 15 and 10 meters it is set as close to minimum capacitance as possible. After the settings of the inductor are known for each band, the inductor is set to the predetermined value and the circuit resonated with the plate tank capacitor.

With an exciter connected to J_1 , the grid circuit should be tuned for maximum drive. The output of the exciter should then be adjusted to give rated grid current. An exciter capable of at least four watts output should be used. With plate and screen voltage applied, the plate circuit should be tuned to resonance and the amplifier loaded to the desired input by means of the "fine" and "coarse" loading controls while maintaining resonance with the plate tank capacitor. **QST**



The comparative low cost of the cubical quad beam antenna, coupled with its favorable gain, has brought it considerable popularity among DX operators. In the tri-band version, the main item of expense has been the required three separate transmission lines. Experimental work by W3AZQ and others has shown that a single feed line may be used with little impairment of performance.

20, 15 and 10 Meters

Without Switching

BY MERELL G. HESS,* W3QEF

Single-Line Feed for Tri-Band Quads

THE three-band cubical quad antenna system which was described in *QST* some time ago¹ was the basis for a lot of discussion among the local hams, to say nothing of the wishful thinking of owning one. Although not much different in size than its single-band brother, the 20-meter quad, simply looking at the complexity of the complete system was enough to stagger one's imagination. Wishful thinking became more wishful as W3AZQ looked at the coax feed lines, thinking of his 75-foot tower two hundred feet from his shack, and hearing cash-register bells clicking off the coax. Wouldn't it work with one piece of coax, like an all-band? Three feed lines and switches are expensive.

Three months later he erected the antenna. As he puts it, "I was the guinea pig. Bill (W3JOH) supplied most of the answers." The results were so satisfactory that five such antennas now dot the local area, with rigs running from 35 watts to 750 watts. Built from the supplied dimensions, not one has been touched up, or tuned, since its erection. On the pilot model, each element was tuned to the center of its respective band and adjusted for the highest front-to-back ratio. Tests

indicate that a 25- to 30-db. front-to-back ratio is obtainable. No trouble has been encountered with feed-line length. Now in the process of rebuilding his larger rig, the DX-35 of W3AZQ is operating with 200 feet of coax on it, with a VK2 and an MP4 under its belt!

Antenna Elements

Fig. 1 is a sketch of the completed antenna. No. 12 enameled wire was used for the 20-meter elements. The radiator requires a 74-foot 4-inch piece of wire with four insulators. The first insulator is fastened 11 feet 2 inches from one end, and the remaining three insulators are spaced along the wire at intervals of 17 feet 4 inches. You now have the four sides of a loop, one side (the bottom) being open at the center. These floating ends will later be fastened to the common feed point which is at the insulator at the bottom of the 15-meter radiator. The 20-meter reflector is constructed from a 74-foot length of No. 12 wire. It is a perfect square, 18 feet 6 inches on each side, with an insulator placed at each corner. There is no open side or other insulators on it.

No. 14 wire was used for the remaining elements. The 15-meter radiator is 11 feet 5 1/4 inches on the sides and top, the bottom being 5 feet 8 5/8 inches on each side, from the center of the insulator. The 15-meter reflector is 12 feet 2 1/2 inches on the sides and top. The bottom is 6 feet 1 1/4 inches on each side, from the center of the insu-

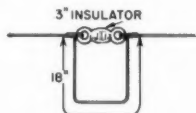
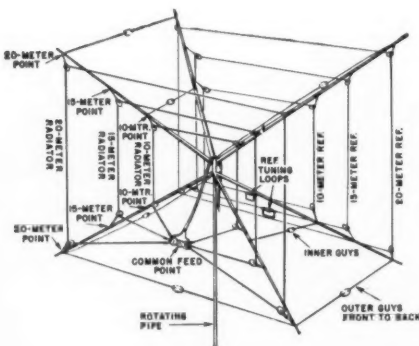


Fig. 2 (above)—15-meter reflector tuning loop. A similar loop, 20 inches in over-all length, is used in the 10-meter reflector.

Fig. 1 (left)—Sketch showing the completed three-band quad. The three radiators are driven from a common feed point. The spreaders are bamboo poles.

* Meade Avenue Extension, Hanover, Penna.

¹ Leach, "A Three-Band Quad Antenna System," *QST*, April 1957.

lator. Hanging from this insulator is a U-shaped piece of wire having a total length of 18 inches. (See Fig. 2.) The final tuning of the reflector was done by changing the length of this small wire. It was easier to adjust the length of this small wire (thereby changing the electrical length of the reflector) than to readjust all four corners.

The 10-meter radiator is 8 feet 1 inch on the sides and top. The bottom is left open with 6½ feet of wire trailing from each of the two bottom-corner insulators. The reflector is another square, 8 feet 9½ inches on the top and sides, and 4 feet 4¾ inches each side of the bottom insulator. As in the construction of the 15-meter reflector, a U-shaped piece of wire, this one 20 inches in length, was added across the bottom insulator.

Spreader Bracket

Following W4NNQ's design,¹ the backbone of the quad framework is a bracket centered on an 18-inch piece of 1¼-inch i.d. pipe. (See Fig. 3.) Black pipe, rather than galvanized, is preferred by the welder. The zinc coating on galvanized pipe causes excessive sparking and toxic fumes. Four pieces of 1 × 1 × ½-inch angle iron 12 inches long and four pieces 11 inches long are required. These pieces are cut square at both ends, one end butting against the pipe.

Displace two of the 11-inch angle irons, A and B, 103 degrees apart and at an angle of 51½ degrees to the pipe. (The shorter lengths will be the radiator supports.) A and B are welded on, 6 inches from one end of the pipe. Next, pieces C and D, 12 inches long, are welded onto the sleeve, below but as close as possible to A and B, at an angle of 51 degrees to the pipe, and 75 degrees from A and B. C is placed opposite B, and D opposite A (see Fig. 3B). C and D will be the reflector supports. The assembly is turned upside down and the above process is repeated, taking care to keep all four shorter pieces on the same face of the assembly. In this case, however, the angle pieces are revolved 180 degrees so that the valleys of the angles will be facing upward, in the same direction as the upper set. Precut plywood jigs helped to maintain the correct angles during the welding process.

The unit was given a coat of primer and finished in enamel. It is designed to slip over a 1-inch pipe mast. Two cases of shearing have caused us to use two ¼-inch bolts in fastening the unit to the mast. One is placed near each end of the

sleeve, at right angles to each other.

Spreaders

Cut off eight pieces of bamboo, just beyond the first joint after the 15-foot mark. With the bracket on the ground, fasten the four upper spreaders in the Vs of the angle iron by means of two hose clamps for each pole, after wrapping the bamboo with several turns of black friction tape to prevent the hose clamps from breaking the finish. Measuring from the outer diameter of the 1¼-inch pipe, along the bottom of each pole, use a soft pencil to mark a point at 7 feet 5 inches. The next point is 43 inches from the first point. The third mark is 43 inches from the second. See Fig. 4.

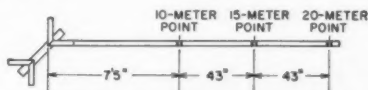


Fig. 4—Sketch showing the spacing between radiator elements along the spreaders. The reflectors are similarly spaced.

Wrap three or four layers of black friction tape around the bamboo centered at each of the three points. These points will be referred to as the 10-meter point, the 15-meter point and the 20-meter point, as indicated in Fig. 4.

Only the four upper poles, now in place, are so marked and taped. Do not mark the points before you mount the poles on the bracket, since measurements must be from the outer diameter of the bracket. Tip the assembly on its side (with a reflector and a radiator pole touching the ground). Fasten a front-to-back guy at the outermost (20-meter) points, keeping these points 13 feet 9 inches apart, center to center, on the bamboo. If you use wire for guying, each span should be broken with an insulator to prevent any resonances. Fasten a front-to-back guy wire at the innermost taped (10-meter) points, keeping the spreaders 6 feet 2 inches apart. With the outer guy in place, the distance between these points should be automatic if the poles are straight. Break this guy wire with an insulator.

Now roll the assembly over so that the opposite pair of bamboo poles are resting on the ground, and the guy wires you have just fastened go up into the air. Fasten other guy wires in a similar manner, keeping the outer points 13 feet

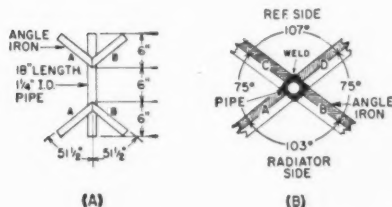


Fig. 3—The spreader mounting bracket. Two sets of four pieces of angle iron, welded to the center pipe, support the bamboo spreaders at the correct angles to provide proper spacing. (A) is a front view showing the angle pieces that support the spreaders for the radiators. Reflector supports are to the rear. The valleys of all angle pieces should be facing upward in this view. (B) is a top view looking down on the bracket and showing the upper set of four supporting angles. Angle pieces of lower set are similarly oriented.

9 inches apart, and the inner points 6 feet 2 inches apart.

Mounting the Elements

Stand the unit upright. You are now ready for the elements. We used No. 12 soft wire to tie the corner insulators to the taped points on the spreaders, as shown in Fig. 5. A slight twist with

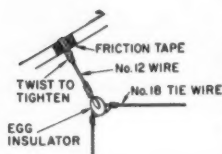


Fig. 5—Anchor wires are used at each corner to facilitate squaring up the wire elements. Tie wires across the corner insulators prevent slipping after final adjustment.

a pair of pliers will allow the wire to bite into the tape, providing a nonshifting anchorage. No. 18 wire was used as a tie around the insulator to prevent the wire from slipping in the insulator.

It would be well to note at this point that the insulators do not "snug up" against the bamboo poles. The 20-meter elements require approximately 1½ inches of wire between the spreader and the insulator, and the 15- and 10-meter elements will require about 2½ feet. These lengths will allow for the "squaring up" process. There is nothing sorer looking than a cubical quad at this stage of construction with all the elements in place before the squaring up begins!

Now fasten the 20-meter radiator to the 20-meter points where you fastened the longer front-to-back guy wires, keeping the open side of the radiator on the bottom side. Fasten the 20-meter reflector to the reflector side of the assembly, tying it to the 20-meter points. You should now have the correct front-to-back spacing of 13 feet 9 inches, since the elements are fastened to the same points as the front-to-back guy wires.

The 15-meter radiator is next fastened to the intermediate, or 15-meter points, with the center insulator (the feed point) placed at the center of the bottom strand. The 15-meter reflector is fastened to the 15-meter points of the reflector side, with the small U along the bottom. The 10-meter radiator is fastened to the innermost, or 10-meter points, with the open side downward, and the 10-meter reflector loop is mounted with the U on the bottom.

Raise the assembly about 10 feet above the ground by slipping the bracket over a piece of 1-inch pipe. The bracket is held in place either by running a ¼-inch bolt through the bracket sleeve and pipe or placing a pipe cap on the bracket sleeve. Fasten the four lower bamboo poles in place, using hose clamps and friction tape as before. Mark the 20-, 15-, and 10-meter points on the four lower spreaders, again measuring from the bracket sleeve and only after the spreaders have been mounted. Wrap these points with tape as you did on the upper spreaders. Now fasten the front-to-back guy wires at the 20-meter points, keeping them 13 feet 9 inches apart, and

the 10-meter points 6 feet 2 inches apart.

Fasten the bottom of the 20-meter radiator to the 20-meter points on the radiator side. Since at this time the bottom side of the 20-meter radiator still remains open, it will be necessary to fasten a permanent guy from one side to the other, keeping the 20-meter radiator points 17 feet 4 inches apart. Break this wire with an insulator to prevent any resonance. You are now able to adjust all four corners of the 20-meter radiator until you have a perfect square. (I used mason's twine tied onto each insulator temporarily to avoid bending and rebending the insulator tie wires during the squaring-up process.)

Now fasten the 20-meter reflector and proceed to square it by adjusting all four corners. Check the front-to-back spacing and adjust if necessary. At this stage you should begin to see the shape of things to come.

Fasten the lower corners of the 15-meter radiator and reflector to the 15-meter points, and square them up.

Fasten the lower corners of the 10-meter radiator and reflector. You will not need a temporary guy on the open side of the 10-meter radiator because the quad will be quite rigid by this time.

During the squaring-up process, sight along each bamboo pole toward the tip to be sure you have not distorted the pole by excessive stress at any tie point.

Now take the loose ends of the 20-meter radiator up and inward and fasten them to the insulator which is in the bottom leg of the 15-meter radiator, one wire on each side. Bring the loose ends of the 10-meter radiator toward this same insulator and fasten one wire on each side of the insulator. See Fig. 6.

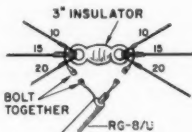


Fig. 6—Method of connecting the coax line to the common feed point. All radiator elements are soldered together at this point.

The 15-meter radiator should remain a perfect square and should not be pulled out of line by strain from the other two radiators. Solder the one set of three wires together. Solder the three wires on the other side of the insulator together. We completed these junctions by adding a terminal lug on each side of the insulator and placing terminal lugs on the coax cable, then bolting the coax onto the common feed terminals. Should it become necessary to remove the coax, it is easier to remove the bolts than to unsolder the junction. The entire junction was wrapped with tape. The single coax cable is easily dressed by taking it over the top of the spreader and allowing it to slant downward toward the common feed point. Some sort of anchorage should be provided here to prevent wear. I used Scotch electrical tape.

None of the quads in the area have actually

been adjusted for maximum performance, element lengths and spacings being the "book" dimensions shown here.

Typical s.w.r. readings shown by a Monimatch are as follows:

28.5 Me.	1.75
29.0 Me.	1.6
29.5 Me.	1.25
21.0 Me.	1.66
21.2 Me.	1.75
21.3 Me.	1.9
21.4 Me.	1.9
14.0 Me.	1.5
14.1 Me.	1.4
14.2 Me.	1.4
14.3	1.35

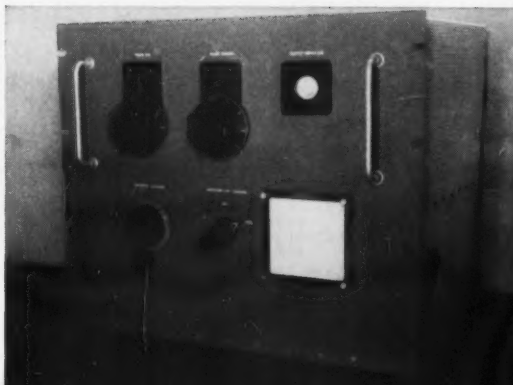
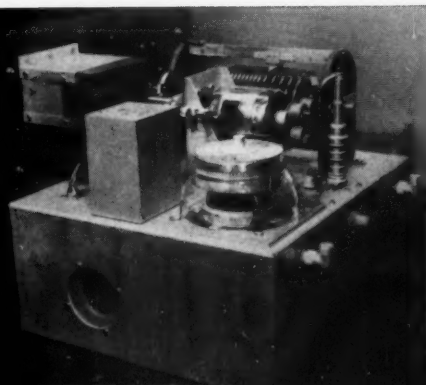
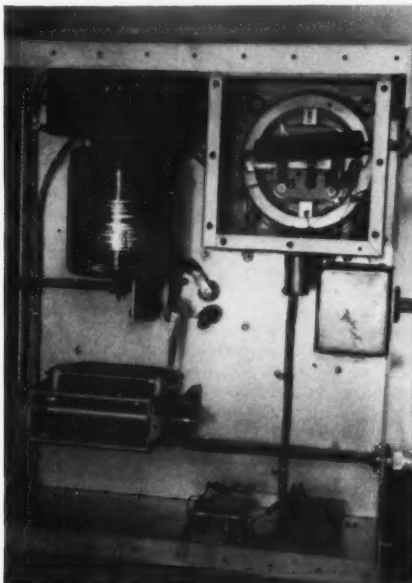
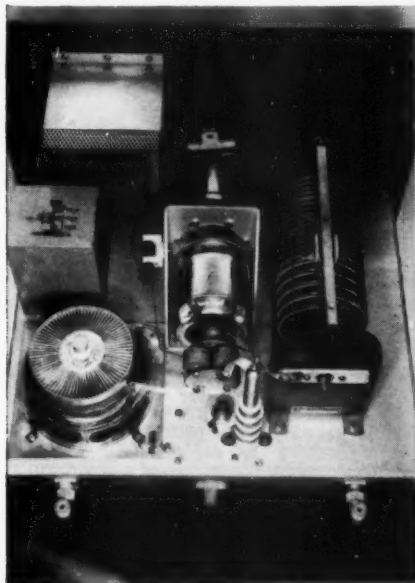
Perhaps the three months of work by W3AZQ didn't extract the last whisker of performance obtainable, but the quads have fulfilled all expectations. One local lad landed a CR6 (his 100th country) with his completed quad just above ground, before he had it up to its ultimate height!

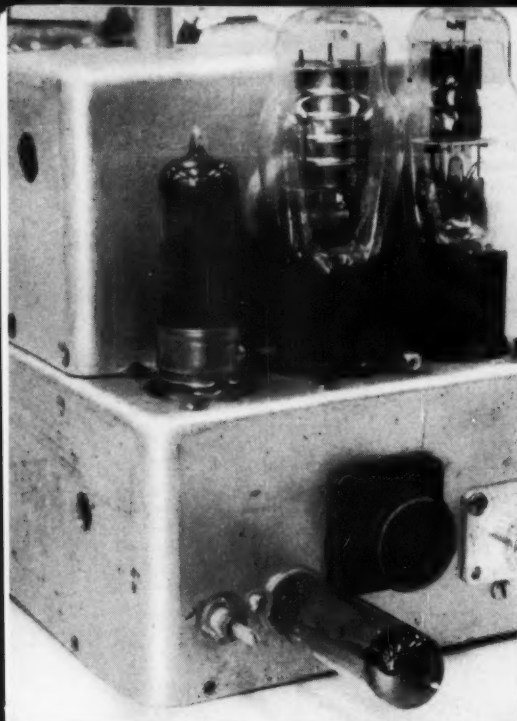
A quad with three separate feed lines definitely has a slight gain over one of this type, but it doesn't take a seat very far ahead. Band switching is simply a matter of tuning the transmitter to the desired band. Flexibility plus — and no expensive coax switches!

The Viking II hanging on the end of the coax has returned more 5-and-9-plus reports from DX-land than I ever expected to hear. I only regret that I did not have one up long before this. **QST**

Strays

K2JEF, noticing the increased interest in amplifiers using a Penta PL-172 or similar tube, has sent along photos of his new final, with the thought that his layout ideas might help others who were embarked on similar construction projects. The photos are pretty much self-explanatory, although we might mention one small point. K2JEF built in a scope for modulation monitoring, the circuit being a duplicate of the system used in the Eidico 100F exciter. What looks like a small neutralizing capacitor mounted on the vacuum variable capacitor bracket is actually the coupling capacitor for the scope. The input circuit is resistive, using a 100-ohm, non-inductive resistor, and about 100 watts of drive are required.





The 12AQ5 doubler and its slug-tuned plate coil are mounted on the rear apron of the chassis. The original 12A6 has been replaced by the 12BY7 mixer above.

Sidebanders who are more interested in 15 than in 20 or 80 will be interested in these simple instructions showing how to put the popular W2EWL exciter on 21 Mc.

Simple Modification for 21 Mc.

BY JOHN V. FILL,* K2GC/4

"Cheap and Easy S.S.B." Goes on 15

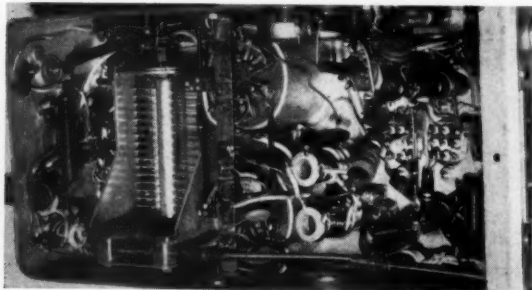
AFTER a year's operation on 20 and 75 meters with the W2EWL Special,¹ I decided to see if this dependable exciter could be made to work on 15 meters. The sideband part on 9 Mc. could be left alone, I figured, and all that should be necessary to do would be to increase the frequency of the BC-458 oscillator from 5 Mc. to 12 Mc. and put in 21-Mc. grid and plate coils.

However, it soon became apparent that the v.f.o. was somewhat unstable at 12 Mc., and hard

to tune. Removing three turns from the top of the original oscillator coil was sufficient to permit tuning the v.f.o. to 6 Mc. with the tank capacitor near maximum, and the stability was greatly improved. To get to 12 Mc., the 6-Mc. pickup winding was fed, as shown in Fig. 1, to the grid of a 12AQ5 doubler stage mounted on the rear apron of the chassis. The plate coil of this stage was tuned to 12 Mc. and link-coupled to the cathode of a 12BY7 in the mixer, instead of the original 12A6. This gives a lot more drive. It may also be of advantage to adjust the value of the mixer cathode resistor for optimum. The octal

* Lt. Colonel, Signal Corps, U. S. Army Ordnance Missile Command, Redstone Arsenal, Alabama.

¹ Vitale, "Cheap and Easy S.S.B.," *QST*, March, 1956.



Partial bottom view showing the doubler coil L_1 at the left, and the mixer-final coupling coils, L_2 and L_3 , near the center.

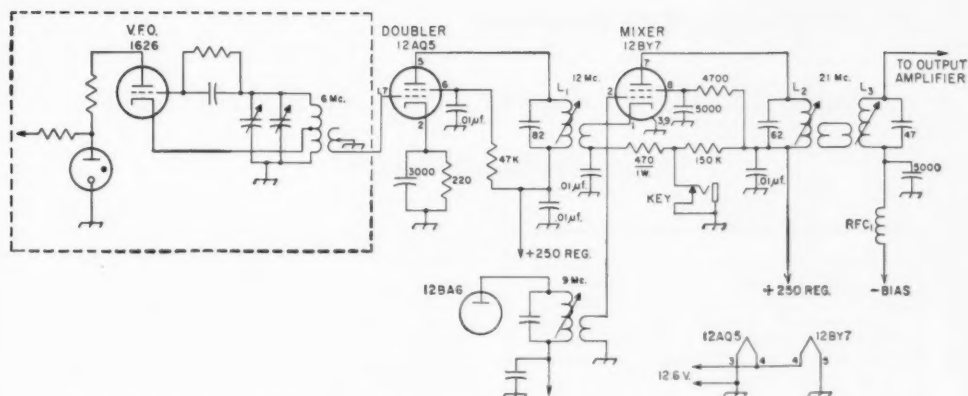


Fig. 1—Portion of the W2EWL s.s. exciter circuit revised for 21-Mc. output. The 1626 v.f.o. and 12BA6 9-Mc. amplifier are in the original circuit.

Capacitances are in $\mu\text{f.}$ unless indicated otherwise. Fixed capacitors in tank circuits should be silver mica or NPO ceramic; bypasses disk ceramic. Resistances are in ohms, and resistors $\frac{1}{2}$ watt unless marked otherwise.

L_1 —Approx. $2 \mu\text{h.}$ —17 turns No. 22 enameled on $\frac{3}{8}$ -inch iron-slug form, 2-turn link coil.
 L_2, L_3 —Approx. $0.8 \mu\text{h.}$ —7 turns No. 16 enameled on $\frac{1}{2}$ -inch iron-slug form, 2-turn link coil.
 RFC₁—500- $\mu\text{h.}$ r.f. choke (National R-50).

socket that formerly held the 12A6 was removed and replaced by a 9-pin socket. When the doubler output circuit is resonated at 12 Mc. there should be enough r.f. at the plate coil of this doubler to light a 60-ma. (pink bead) bulb connected across a couple of turns of wire when placed close to the coil. An absorption wavemeter is handy to make sure that the output is at 12 Mc.

The 9-Mc. sideband signal is link-coupled to the control grid of the 12BY7 mixer. This is the reverse of the procedure in the original W2EWL Special but results in much more drive for 15-meter operation.

The plate of the mixer is series fed, with its tank circuit tuned to 21 Mc. and linked to a similar LC arrangement in the grids of the 1625s. This helps get rid of unwanted harmonics of the 9- and 12-Mc. signals.

The final plate coil is three turns of Air-Dux 1610, 2 inches in diameter, 10 turns No. 16 per inch. With 600 volts on the plate of the final and $22\frac{1}{2}$ volts of battery bias, there should be enough r.f. available to fully light a 50-watt, 115-volt bulb in place of the antenna, with normal audio input.

Rather than use the original method of switching the exciter on and off, I prefer to break the B-plus 250 volts to all tubes but the first two 12AT7s. This keeps everything quiet and cooler during reception and allows VOX operation from the plate of the third a.f. tube which is coupled through a 0.01- $\mu\text{f.}$ capacitor to the VOX. For c.w. operation, the original keying method in the cathode of the mixer is used.

The results on the air either "barefoot" or driving a pair of 813s in grounded-grid have been excellent.



This side view shows the mounting of the 3-turn 21-Mc. final-amplifier coil.

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Small Transistor Power Supplies at Low Cost

BY C. A. THUNEN,* W6ACT

With an old audio-transformer core and a small amount of wire, it is no trick at all to cut the cost of a small transistor power supply considerably by winding your own transformer. W6ACT shows how a satisfactory design may be determined experimentally.

TRANSISTORS are getting cheaper. By taking advantage of this fact and by building the transformer it is easy to build a satisfactory power supply for a receiver or a mobile transmitter. Most of the transistor power transformers on the market are quite expensive, but an old audio transformer can be rewound to make a suitable substitute. If the core is a half inch or so in thickness it will do. Not much iron is necessary as the frequency will be considerably higher than 60 cycles.

Determining Ampere-Turns

The first step is to strip off the old winding and make a wood winding form with the same cross-sectional dimensions as the core. A temporary trial winding is then made to use in determining the proper number of turns for the final winding. To make this winding, cut a strip of cardboard the same width as the opening in the window of your transformer core. Wrap a single layer of this cardboard around the wood form and secure it with a turn of friction tape. On opposite sides of the form, lay strips of tape, sticky side out, lengthwise on the form. When the winding is complete, the ends of these two pieces of tape are folded back over the winding to hold it in place.

Now wind 20 or 30 turns of enameled wire around the center of the form on top of the cardboard, and tape. Any wire size from 16 to 20 will do. When the first coil is in place, put on two more similar coils, one on either side of the first. There is nothing critical about these coils, and smaller wire may be used. When the three coils are wound, tape them up and assemble them on the core.

The next step is to connect the first coil to a 6-volt storage battery in series with a rheostat, a switch and a d.c. ammeter. To one of the other coils a low-voltage source of 60-cycle a.c. should be connected. A voltage of 2 to 6 is about right. The third coil should be connected to the vertical plates of an oscilloscope. The sweep frequency may be almost any value since any pattern will

give the desired indication.

Turn on the a.c. and there should be a picture on the scope face. Now close the d.c. circuit and increase the current by adjusting the rheostat. As this is done, the pattern on the scope will decrease in height. Advance the rheostat control until the pattern just disappears, and read the current. When this current is multiplied by the number of turns in the first coil, the product is the number of ampere-turns necessary to saturate the core. The operation of the multivibrator-type circuit requires that the core saturate, and this should occur without exceeding the maximum collector-current rating.

Primary Winding

Having determined the number of ampere-turns to saturate the core, you may proceed to design the final winding. To do this, first choose the power transistors you will use, and find the collector-current rating from the manufacturer's literature. CBS Hytron 2N255 and 2N256 are low in price and will work well. Divide the ampere-turns for saturation by the collector current and you have the number of turns for the primary winding of your transformer. The proper wire size may be found in the wire table in all editions of the ARRL *Handbook*. There will be two coils and each will conduct only half the time, so the wire need be only large enough to carry half the rated current of the transistor.

Before winding the coil, make a couple of removable ends with square holes to slip over the wood form to confine the winding to the space available in the core window. An insulating base of thin cardboard or heavy paper should be put on the wood form, with strips of tape as before. For the final primary coil, two strands of enameled wire are wound in parallel. Cut two pieces of the primary wire and holding them parallel, wind on the number of turns determined above. Be sure to leave sufficient lead length at the starting end for connections. When this double primary coil has been wound, fold the tape ends down to hold it in place and wrap it with a thin layer of insulating paper.

Bias Winding

On top of this layer of paper lay two more strips of tape to hold the next winding. This is the base-bias winding and is put on in the same manner as the primary, winding two wires in parallel. For this winding smaller wire may be used. No. 28 is about right. Wind on about one fifth as many turns as in the primary winding.

* 704 G St., Crescent City, Calif.

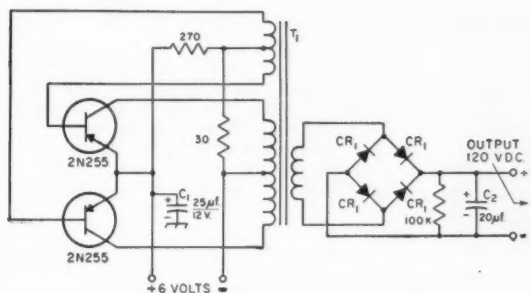


Fig. 1—Suitable circuit for a small transistor power supply. Resistances are in ohms and resistors are 1 watt. C_1 and C_2 are electrolytics. See text referring to connection of C_1 . The rectifiers, CR_1 , are Sarks Tarzian type M-150. The transformer T_1 is described in the text.

The secondary coil goes on next, but before starting it you had best test out what you already have so as not to waste the time and material on the secondary coil if the primary is not going to work.

There are many circuits which will oscillate with the power transistors available. The circuit shown in Fig. 1 has worked well in a receiver power supply. C_1 is a hash suppressor. It should be connected from the ungrounded side of the 6-volt line to chassis. If the positive side of the line is grounded, the capacitor should be connected from negative to chassis with the positive side of the capacitor to chassis.

Testing the Primary

Assemble the partial winding on the core and wire up your favorite circuit. Be very careful to connect the d.c. supply with the correct polarity, or the transistors will be ruined. In case you are not familiar with transistors, there is a little trick to help in remembering the various polarities. Transistors are designated p-n-p or n-p-n and these letters refer to the polarities of the elements. The center letter gives the polarity of the collector and "center" and "collector" both begin with c. How can you miss?

When power is applied, the circuit should oscillate and you will know it as you can hear it buzz. If all goes well and it oscillates, you are ready to design the secondary winding. Wind five or six turns over your coil by threading them through the core. Apply power and measure the voltage on this temporary secondary coil. It is an a.c. voltage, so use an a.c. voltmeter. By dividing the number of volts by the number of turns, you find the volts per turn, and by dividing the volts per turn into the desired secondary voltage, the number of turns for the secondary winding is found.

Now take the transformer apart, put the winding back on the form and wind on the secondary coil. Use a wire size that will just about fill the remaining space in the core opening. If a center tap is desired, wind two secondary coils. For the same rectified output voltage, each secondary must have the number of turns previously estimated. However, the wire need be rated for only half the load current. The two coils should be connected so that they assist. If little or no voltage output is obtained when the

two windings are connected in series, reverse connections to one of the coils. In general, the secondary current that can be drawn safely without damaging the transistors will be approximately twice the collector current rating divided by the ratio of secondary turns (one secondary if center tap is used) to one half the primary turns.

A power supply built by the method described above worked quite well. 2N255 transistors were used and the supply was designed to work from a 6-volt battery. The collector current runs about 2 amperes and the open-circuit secondary voltage is about 120 volts d.c.¹ This particular supply was designed to operate a BC-474 surplus receiver which requires 90 volts and, under load, the supply delivers just about that voltage. The rectifiers used were Sarks Tarzian M-150 silicon units and they cost 90 cents each. The transistors are listed at \$1.32 each. By using a junk-box transformer, all the rest of the components can be purchased new for less than \$10.00.

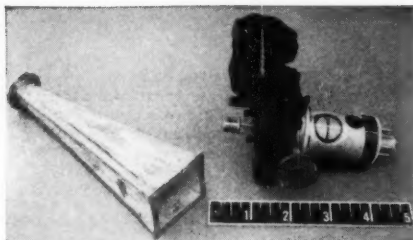
Such details as the exact number of turns and wire sizes which were used in the supply described here were purposely omitted since this article was intended to enable you to design your own power supply. QST—

¹ Unless special transformer core material is used, transient spikes of collector voltage may develop sufficient amplitude to damage the transistor in time. If a check on an oscilloscope shows spikes exceeding the maximum collector voltage rating, it would be advisable to connect a 25-μF, 50-volt electrolytic capacitor and a 200-ohm resistor in parallel from each base to chassis, connecting the positive side of the capacitor to the base. —Ed.

Strays

WSOPR had a new tri-band beam and tower in his back yard and in the process of getting it lined up to suit himself had to climb it a number of times. After watching these proceedings for a while, a neighbor's child asked, "Does your erector set work better now?"

Another "first"? W1AMO operated mobile (or was it portable in motion?) from a large brick house that was moved about a mile. He used a gasoline generator to power the gear.



One of the klystrons and a radiating horn used in the 36,500-Mc. experiment. The ruler in the foreground gives some impression of the size of components at this frequency.

Amateur Communication at 36,500 Mc.

THESE pictures show Richard G. Somers, W6NSV, and William J. Odum, K6YYF, with gear they set up for two-way work on a frequency of 36,500 Mc. The work was done in July, 1957, which makes it the first known instance of amateur two-way communication on any frequency in the unassigned territory above 30,000 Mc. For various reasons the work could not be reported heretofore, but is detailed here as a significant contribution to the amateur record.

The experiment took place on the roof of a Hughes Aircraft Company building in Culver City, California. The size of the building limited the distance to 500 feet, but there was every indication that at least three times this distance would have been possible. The transmitter used by W6NSV employed a Raytheon QK291 klystron, velocity modulated with keyed 1000-cycle square-wave tone. The klystron output was fed to a radiating horn through a directional coupler, a microwave frequency meter and a slotted line section. Power was obtained from laboratory-type regulated supplies.

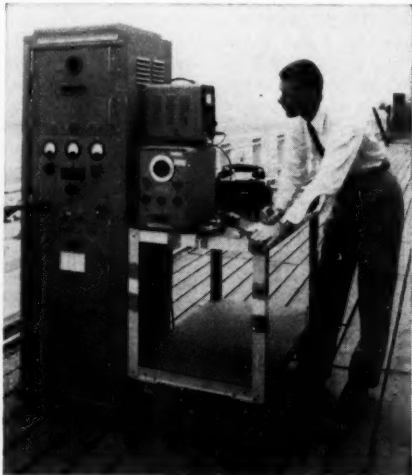
K6YYF operated a Hughes-built transmitter, equipped with automatic frequency control cir-

cuits and its own regulated supply. It was also modulated with a 1000-cycle square wave, keyed for m.c.w. communication. The horn antenna was similar to the one used with the other transmitter. Portable pack sets were used in preliminary alignment of the microwave horns.

Both receivers used tuned horns coupled to crystal detectors. The output of the detector was fed to a sensitive audio amplifier tuned to the modulation frequency. At 0.0082 meters, the operating wavelength, the horn aperture is 8.5 by 12.2 wavelengths providing beams narrow enough to provide isolation between horns, and duplex operation was carried out using the same frequency for both stations. This is a duplex system somewhat different from those normally used in amateur microwave communication. Use of straight crystal-detector and audio-amplifier systems for receiving also is a different approach to microwave work by amateurs.

W6NSV and K6YYF expressed their appreciation to R. W. Clapp of the Microwave Laboratory of Hughes Aircraft Company, for his assistance in making the nonclassified equipment available for use in the experiment. QST

W6NSV and K6YYF working two-way on 36,500 Mc. Laboratory-type equipment was used on a rooftop at the Hughes Aircraft plant in Culver City, Cal.



QST for

ARC-5 receivers lend themselves to all sorts of ham adaptations, including combinations. This one uses the 200-500-kc. BC-453 (the "poor man's Q5-er") for high selectivity and vernier tuning, getting its signals from 3-6 and 6-9 Mc. receivers that have been modified to give 455 kc. instead of audio output. As the author comments, it's a lot of receiver for a little money.

Selectivity and

Stability at Low Cost

BY FRANK S. GUE,* VE3DPC

An ARC-5 Triple Superhet

ANYONE investing in the ARC-5 receivers will soon respect them for their stability and simplicity but will regret their lack of selectivity, bandspread, b.f.o.-a.v.c. switch, b.f.o. pitch control, low-impedance input, and other refinements of conventional receivers. All these problems can be overcome if the BC-453 (190-550 kc.) is used as a highly-selective third-i.f. channel for the higher-frequency receivers. The BC-454 (3-6 Mc.) and the BC-455 (6-9 Mc.) can readily be converted by replacing their audio circuitry with a second converter, producing a 455-kc. output for the BC-453. This can be done by using the erstwhile b.f.o. coils designed for the high intermediate frequencies of these receivers as high-frequency oscillator coils in the new lineup. Thus the low selectivity of the high-i.f. receivers is replaced by the well-known sharp selectivity of the Q5-er. Also, the too-fast tuning rate of the high-frequency receivers is supplemented by the dial of the BC-453, which can be used to examine the approximately 10-kc. passband of the 455-kc. channel at a tuning rate only one tenth as fast; where the dial of the BC-454 or -455 covers 100 kc. per division, the dial of the BC-453 covers only 10 kc. per division.

Use of the original FT-220-A rack in which the receivers were originally installed, plus some modifications to be described, provides the rest of the conveniences named above. Numerous other modifications not discussed here were made; for example, a separate audio chassis with a Select-O-Ject was built. We doubt that anyone would want to duplicate our setup exactly, but

the advantages of utilizing these receivers in this fashion are considerable. For a few dollars, the amateur with a reasonable knowledge of circuitry can develop a receiving system which, for selectivity, stability, and ruggedness is hard to match. The high-frequency receivers, of course, cover only 3.0 to 9.1 Mc., but can be used as building blocks for the higher bands by application of crystal-controlled converters. This is a lot of receiver for a little money.

Mechanical Arrangements

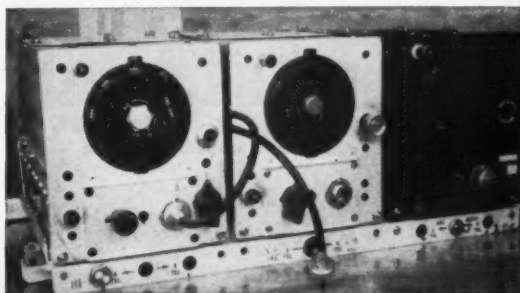
If you can find an FT-220-A receiver rack, use it as a side-by-side mount for the units, which should plug into a socket strip at the rear.¹ The switches on the rack should be removed and the audio-response switch, receiver selector, and a.v.c.-b.f.o. switch mounted in the vacated holes. The necessary wiring can be concealed neatly in the front channel and passed back through the tubes which form part of the rack to the strip at the rear. The extra converter tube required in the BC-454 and BC-455 replaces the detector-b.f.o. tube (12SR7) and so a new socket is not required. The new i.f. transformer occupies the place of the removed audio output (12A6) stage. Low-impedance r.f. inputs and outputs are used throughout, requiring modifications to the antenna coils on all three receivers and to the 455-kc. i.f. transformers. An unused corner in the front of the BC-453 is used for a pitch-control

¹ The author substituted an octal male plug for the connector on the rear of each receiver, and mounted octal sockets on the strip at the rear of the rack, aligned with the plugs when the receivers are slid into the rack. This modification can be omitted if the rack is already equipped with receptacles, since seven prongs will suffice for the wiring of Fig. 4 if one side of the heater supply is grounded.
— Editor.

* 2252 Joyce St., Burlington, Ontario, Canada.

The receivers lined up on the mounting rack. The BC-453 is at the left; the bar knob at its lower right corner is the b.f.o. pitch control. The adapter panels on all three receivers have been fitted with gain controls and coax sockets for low-impedance antenna input. Each of the high-frequency receivers has its own 455-kc. output cable, seen between the first two units. The proper cable must be connected to the BC-453 input when changing h.f. receivers.

August 1959



capacitor. The r.f.-i.f. gain control, normally mounted on the remote equipment, is brought to the front of each receiver, using terminals which exist for it on the adapter-plug receptacle, the face plate of which is used to mount the input coax connector and gain control for each set.

Low-Impedance Input

Low-impedance r.f. input is a more conventional feed system which ties in better with most amateur antenna and feed-line arrangements. In any case, its use is essential with the BC-453 low-frequency receiver to avoid exposing unshielded wire which will pick up unwanted signals. Complete shielding is vital in a multi-super lineup.

The procedure is as follows: Remove the adapter plug panel at the front of the set. Remove the plug itself, the small knob on the front, and its associated shield from the small panel. Drill this panel suitably and install the coax connector of your choice; we used Jones 101s. Beside it, install the r.f. gain control for the set; the 50,000-ohm wire-wound control intended for the job, which is mounted on the remote unit, is ideal. However, almost any miniature pot will do. Connect it to Pins 6 and 7 of the receptacle in the receiver by soldering 4-inch lengths of flexible hook-up wire between the control and prongs. You won't need the plug feature again so don't worry about getting solder in the prongs.

Connect the coax connector by means of 6 inches of shielded wire, which is run through a hole you must drill in the corner of the plug mounting can in the receiver, to Pins 1 and 6 on the antenna coil receptacle. This receptacle is accessible after the front-end coil assembly is removed. These pins, unused in the original circuit, are now employed to bring the antenna input into the antenna-coil can. See Fig. 1 for pin numbers.

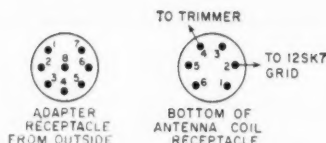


Fig. 1—Pin numbering of adapter plug receptacle and antenna coil receptacle in the ARC-5 receiver. These are male receptacles.

Now remove the antenna coil from its can by removing the four small screws which hold it. Wind on the new antenna primary coil immediately above the main coil on the form. See Table I. Tie the coil to Pins 1 and 6 on the coil socket and dope the finished coil with cement or beeswax.

Table I

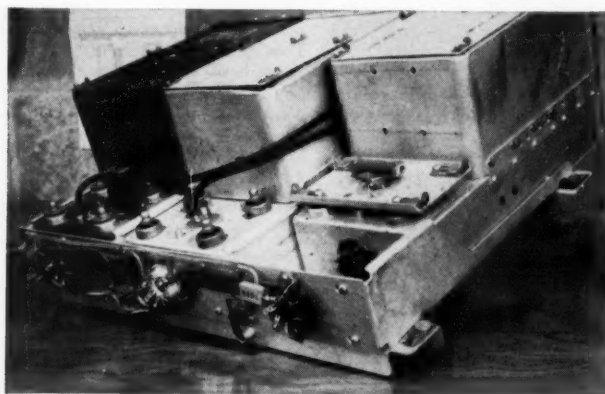
Low-Impedance Antenna Primary Coils

Receiver No.	Number of Turns on Primary Coil	Wire
BC-453	60	No. 32 enam. close-wound
BC-454	25	"
BC-455	16	"

Re-install all items, coiling up the surplus lengths of gain control and coax lead inside the box.

Installing a Converter

Remove the 12A6 tube and socket and all associated wiring. Remove the 12SR7 tube and all wiring except that for the heater. (It is assumed that the heater wiring has been modified for 12.6 volts as described in other articles.) Wire the 12SR7 socket for a 12K8 converter as shown in Fig. 2. It will be necessary to drill a grommet hole in the side of the last i.f. transformer for the lead to the 12K8 signal grid. This



Rear view of the assembly, with the BC-453 partly pulled out of the rack. To reduce internal heat in the BC-453 the divider resistor has been moved to the "back porch" and a number of holes drilled in the case.

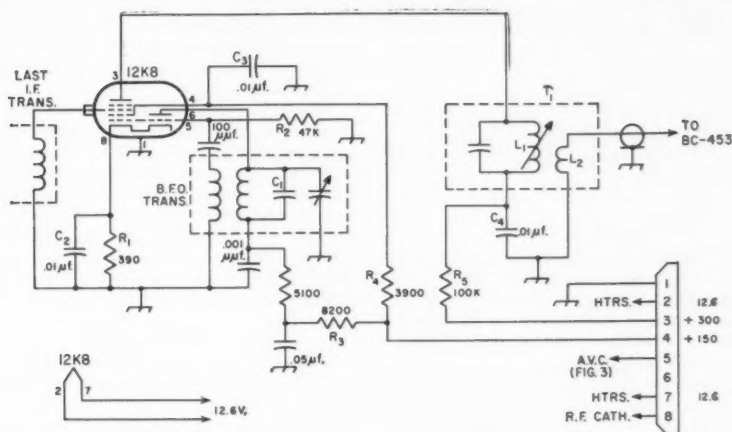


Fig. 2—Converter circuit for 455-kc. output from 3-6 and 6-9 Mc. receivers. The 12K8 replaces the 12SR7 in the original receiver circuit. Components without circuit designations are in the original circuit; new components are listed below.

C₁—100- μ f. silver mica for 2830-kc. b.f.o. coil; 300- μ f. silver mica for 1415-kc. b.f.o. coil.

C₂, C₃, C₄—0.01-μf, disk ceramic or paper

R_1 —390 ohms, $\frac{1}{2}$ watt.

R₂—47,000 ohms, ½ watt.

R₃—8200 ohms, 1/2 watt.

R₄—3900 ohms, ½ watt.

R₅—0.1 megohm, 1/2 watt.

T₁—455-kc. i.f. transformer, modified (see text). L₁ is the original primary coil; L₂ is 60 turns of No. 32 enam. close-wound on form near L₁.

lead must be soldered to the vertical rod which is the output connection of the secondary of the last i.f. transformer. If the second i.f. uses a 12SF7,² remove all wiring to pin 5 of this socket and ground this pin, which is the diode plate in the 12SF7.

Almost any 455-kc. i.f. transformer not more than 1¼ inches square and 2¾ inches high will serve as the 12K8 output transformer. Remove the existing secondary, and substitute a coil of 60 turns of No. 32 enameled wire, close-wound on the form beside the remaining (primary) coil. Install this over the vacated 12A6 socket. Connect a 3-foot length of RG-59/U coaxial cable to the terminals of the new 60-turn coil, bring it out through a grommeted hole in the rear shelf of the chassis, and terminate this in a Jones P-101 connector.

To make the h.f. oscillator of this 12K8 second converter tune to $2830 - 456 = 2374$ kc.,

² This tube is used in some series of the ARC-5 receivers but a 12SK7 is used in other series. This modification, of course, is not required if the tube is a 12SK7. — *Editor.*

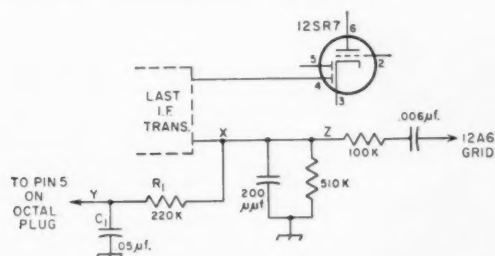


Fig. 3—Second-detector modifications in BC-453 to add a.v.c. Components without circuit designations are the same as in the original receiver circuit. The a.v.c. filter, consisting of R_1 and C_1 , is connected at X. Wiring from Z to the 12A6 grid should be disconnected if an external audio amplifier is used, and point Z connected to pin 8 of the octal power socket through S_1 (see Fig. 4).

that receiver, which should have been disconnected and left floating during the initial dismantling. A convenient tie point in the BC-454 is the No. 1 pin of the second i.f. transformer; in the BC-455, the front pin of the rear capacitor unit (part No. 5414) on the right side of the chassis when the receiver is upside down with its front facing you.

B.F.O. Pitch Control

All ARC-5 receivers are built without panel control of b.f.o. frequency, which is obviously unsatisfactory for amateur purposes. The modification to overcome this is done by installing a 75- μ mf. APC variable to the left of the adapter panel (receiver held upside down) in the BC-453. The capacitor shaft is brought out at the same height as the "Align Input" control on the other side. This capacitor is connected through RG-59/U coax to the 85-ke. b.f.o. transformer (part No. 5852), bottom terminal. This coax must be firmly cleated down at two or three points to prevent any movement, since the cable becomes part of the tuned circuit of the b.f.o.

To compensate for the added capacitance of the cable and 75- μ mf. pitch control, 43 turns should be carefully removed from the b.f.o. transformer coil. A suitable shield for the capacitor, a precaution against radiation of the b.f.o. signal inside the front end, can be cut from one of the discarded adapter socket cans and bolted to the chassis using several of the small screws which are available everywhere on this equipment and which become surplus when unneeded components are removed. Saw the feet from one of the surplus capacitors to use as nuts. This shield is shown in one of the photographs.

B.F.O.-A.V.C., Receiver-Selector and Audio-Response Switches

The circuit of the b.f.o.-a.v.e. switch, which can be one of the little s.p.d.t. switches removed from the rack, is shown in Fig. 4. Thanks to the simple method originally used of switching off the b.f.o. by grounding its B supply, and thanks also to the fact that the b.f.o. grounding line is brought out to the rear in these receivers, the s.p.d.t. switch merely grounds the b.f.o. line in the a.v.e. position, and grounds the a.v.e. line in the b.f.o. position.

The receiver selector is another s.p.d.t. switch

which applies heater power to one or the other h.f. receiver. We would rather have left the heaters on and switched the B supply, but were short of heater current.

The high 85-ke. selectivity results in rather boomy speech. We installed a very small (100 μ mf.) audio coupling capacitor in the output line with an s.p.s.t. switch on the front to short it out. Thus the audio response at low frequencies can be cut sharply for phone reception or left normal for c.w. or zero-beating. This is a very simple system; a more satisfactory one would compensate for the considerable change of level which results, or would use a high-pass filter.

Reducing Drift

Considerable thermal drift was experienced at first. We cooled off the BC-453 by drilling four $\frac{1}{4}$ -inch holes through each side of the shield which houses the tubes and the i.f. cans, right opposite the tubes and as low as possible. Several more holes, in a line above each tube string in the cover for the tube compartment, then established a circulation of air to carry away the tube heat. We then removed the 12A6 on completion of a separate audio chassis, and moved the two dropping resistors, part No. 5895, outside the chassis. In addition, the r.f. stage tube of the l.f. receiver was removed and a 10- μ mf. coupling capacitor, connected between the grid and plate prongs in the socket, was substituted. This keeps the gain to manageable proportions.

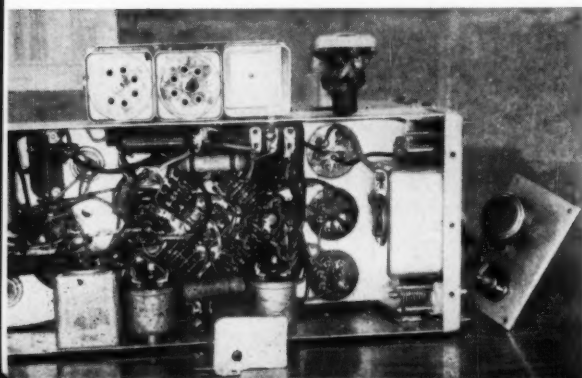
These reductions in both generated and accumulated heat completely eliminated the drift problem.

Gain and Selectivity

Gain is far greater than is required. We removed the first i.f. stage in each h.f. receiver, in addition to the r.f. stage in the l.f. receiver as described above, substituting octal plugs with 10- μ mf. capacitors bridging the plate and grid pins in each case. The BC-453 receiver is operated with the 85-ke. i.f. transformers as loosely coupled as possible, by drawing out the fiber rods which project from the tops of the i.f. cans to the limit of their travel.

Tuning and Setting Up

Check the BC-453 receiver by tuning it to a frequency near the i.f. of any broadcast set, 455 ke., or thereabouts. Tune the broadcast set to any strong signal and bring a length of insulated



This view shows the gain control and coax input connector on the adapter panel, and also shows the b.f.o. pitch-control capacitor in the lower right-hand corner. The shield sitting in front of the chassis covers the b.f.o. capacitor when the BC-453 is reassembled. The low-impedance primary for the antenna coil (upper right, removed from the shield) is wound on the phenolic form alongside the universal-wound coil.

QST for

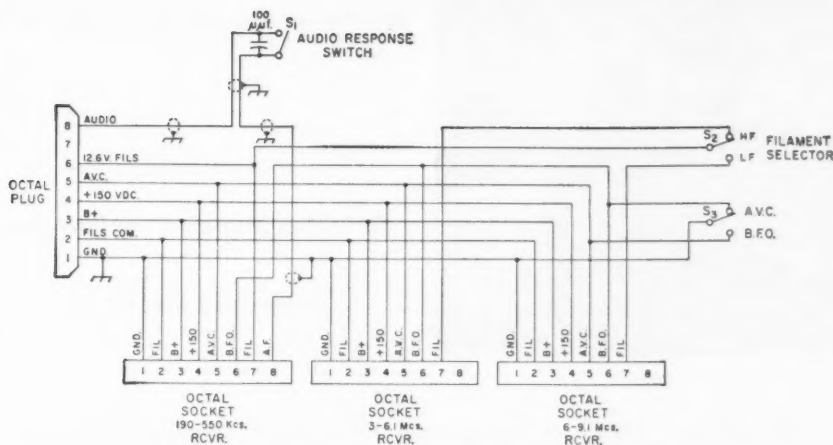


Fig. 4—Power and control wiring. S_1 is an s.p.s.t. toggle; S_2 and S_3 are s.p.d.t. toggles

wire near the plate pin of the last i.f. stage, connecting the other end to the "A" terminal of the BC-453. The broadcast station should come in loud and clear on the BC-453. Transfer the wire to the newly-installed coax socket; it should also be possible to get a good signal there.

Now connect either h.f. receiver to its power supply and check that the oscillator section of the second converter is running. This is most easily done by checking the bias voltage on the 12K8 cathode and shorting the oscillator grid to ground. The bias should rise sharply when you do so, indicating that oscillation has ceased.

Now it is necessary to establish the second i.f., which must be somewhere near the nominal frequency of the modified 455-ke. i.f. transformer you have just installed. You can hit it right on the nose with a b.c. set used as a frequency meter. Assume you are setting up the BC-455 (6-9.1 Mc., design i.f. 2830 ke.) and that you want to produce a second i.f. of 455 ke. The ex-b.f.o. of the BC-455 now has to tune to $2830 - 455 = 2375$ ke. Tuned to 960 ke., your broadcast set's local oscillator will have a second harmonic at $2(960 + 455) = 2830$ ke. This will beat with the BC-455's new second h.f. oscillator, if it is running at the desired frequency of 2375 ke., to produce the broadcast set's own i.f. of 455 ke. Thus it is only necessary to tune the broadcast set to 960 ke. and rock the BC-455's b.f.o. tuning capacitor (accessible through a small hole in the side of the chassis) until a strong unmodulated carrier is heard. If your broadcast set has a different i.f., or if you want a different second i.f., you'll have to go through the above arithmetic for that particular set of frequencies.

In setting up the 3-6 Mc. BC-454, tune the broadcast set to the same frequency and repeat the operation; it so happens that the frequency relationships are the same, except that you are using the fundamental of the broadcast set's

oscillator.

This technique takes advantage of a common form of BCI in the 160- and 80-meter bands, in which the amateur signal is tunable on the broadcast set even though the signal is far out of the tuning range of the receiver being interfered with.

Now that the new oscillators in the high-frequency receivers are on frequency, you should be able to hear signals from the front end of either one of them when you connect its output coax to the input connector on the BC-453, and connect an antenna to the "A" terminal or coaxial input of the high-frequency receiver. Peak up the signals by tuning the BC-453, both main tuning and "Align Input" controls, and then the 455-ke. output transformer in the h.f. set. *Note:* Once you have lined up the BC-453 on one of the h.f. sets, make no further adjustments to it. When proceeding to bring the second h.f. receiver into line, limit your adjustments to its second oscillator and the output 455-ke. i.f. transformer *only*. This will make it possible to switch from one receiver to the other without retuning the BC-453.

Some day we'll put the receiver selector function on a single switch which changes both B supply and antenna inputs in a single operation. If you're starting from scratch, this would be a worthwhile feature to incorporate. The setup we have described requires that two coaxial connectors and a switch be changed when changing bands, which is inconvenient.

Having done all the above, and assuming your receivers worked O.K. before the modifications, you need not touch any other alignment adjustments.

This makes a great little lineup. Treat it with respect and you may find yourself still getting good service from it 12 years later, as we are here!

QST



The authors and the receiving set-up at Ithaca. Left to right, K2LMG, K2OUX/W1MVV, W2YBP.

Reflected Signals from Satellite- Generated Ionization

Radio Detection of Silent Satellites

BY CLAYT ROBERTS,* K2OUX/W1MVV, PAUL KIRCHNER,* W2YBP,
AND DAVE BRAY,* K2LMG

The effects described in this article show definite correlation with satellite passages, and form a new method for detecting satellites without transmitters. Amateurs properly situated with respect to WWV (within the skip zone) or other continuous signal have the opportunity of making similar observations.

THE majority of amateurs are interested in the conditions of the ionosphere and upper atmosphere to some extent because of the effect they are known to have on propagation. We are interested in finding out if 20 meters is wide open or washed out as a result of the *F*-layer conditions over certain areas, or if there is an inversion or aurora existing for v.h.f. enthusiasts. Operating conditions depend so much on just what is going on "up there."

With the launching of several earth satellites by both the U. S. and Russia this past year interest has been aroused in the effects that might result when such a vehicle, traveling at speeds of 18,000 miles per hour or more, passes through the upper atmosphere and areas of the ionosphere. We know that there must be gas molecules present in the upper atmosphere as well as charged particles which make up the ionosphere itself. It has recently been found that the ionosphere exists at much greater altitudes than was earlier anticipated. It has been speculated that enough ioniza-

tion to support radio transmission could be produced by the motion of a satellite as it orbits around our earth. One method for obtaining clues to such conditions is to search for and analyze certain effects on electromagnetic waves which can be matched with the passage of satellites.

Last October, the authors started looking for such effects. As a beginning point, we figured that if such an ion cloud did exist its critical frequency would be below the v.h.f. region, because various types of radar operating at v.h.f. and above see satellite echo areas of essentially the same dimensions as the physical dimensions of the satellite. Thus it was apparent that lower frequencies must be used to obtain reflections from the ion clouds. Having no high-power radar or California kilowatt transmitters at our disposal, we decided to use the WWV transmitters, which seem to be most conveniently located with respect to Ithaca, N. Y., for such observations. The search for reflected signals was made on 5, 10, 15 and 20 Mc.

Preliminary results indicate that disturbances which are correlated with satellite passes do exist. Through the use of the various frequencies, more than one type of disturbance has been observed. On the 20-Mc. frequency a fast flutter, similar to the familiar airplane flutter seen on TV screens, was observed. We had expected to find this, as it had already been reported by W8JK.¹ However, at 15 Mc., and especially at 10 Mc., two very different types of disturbance were found.

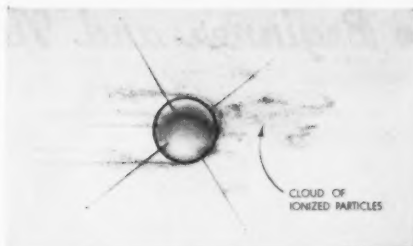
"Doppler" and "Rumble"

The first effect observed at 10 Mc. differs from

* General Electric Company, Advanced Electronics Center, Cornell University, Ithaca, N. Y.

¹ Kraus and Dreesse, "Sputnik I's Last Days in Orbit," *Proceedings of the IRE*, Vol. 46, No. 9, pp. 1589-1587, Sept. 1958.

Although the air is extremely thin at heights of some hundreds of miles there are enough molecules to form a detectable reflecting cloud, when ionized by bombardment of the speeding satellite. Like the well-known ionized meteor trail, such an ionized cloud often can reflect high-frequency signals with enough strength to be observable, under proper receiving conditions.



the flutter type of reflection obtained at 20 Mc. in that the signals received contain an audio tone of changing frequency. This tone is not transmitted by WWV. The frequency change is similar to that which would be obtained from a transmitter aboard the satellite itself, and for this reason has been called a "Doppler" reflection. The reflected signal bouncing off the satellite and its ion cloud beats with the WWV carrier received by ordinary sky wave.

The audible Doppler beat note is not clean sounding. When observed on a spectrum analyzer, it is seen to consist of a smear of frequencies 50 to 200 cycles wide moving, as would be expected, from a few hundred cycles gradually through zero beat and up again. As might be anticipated, observations indicate that the Doppler is heard more often at night. The density of the ion cloud partially surrounding the orbiting vehicles is probably dense enough for reflections at this frequency during the day, but at that time the reflected signal is absorbed more by the stronger ionosphere.

The second observed effect is in the form of a delayed disturbance. This effect is a very rough audio note containing components between 60 and 400 cycles. It is delayed approximately 8 to 10 minutes after known satellite passages (and after the Doppler disturbance). The frequency distribution remains relatively constant with time, not varying in pitch as the Doppler signal does, and for this reason the effect has been called a "rumble." The duration of the "rumble" varies from a few seconds to nearly one minute. There are several clues to the cause of the "rumble," but nothing conclusive as yet.

The effects described have been heard on both 10 and 15 Mc. However, generally speaking, the disturbances observed on 15 Mc. have been much less frequent and considerably weaker than on 10 Mc. It has been found that the "rumble" is more consistent in its appearance than the "Doppler" and, on the lower-altitude passes of the satellites, it generally appears both day and night.

So far no extensive effort has been made to explain the Doppler and the rumble disturbances in detail, although a large number of observations have been made on the two components of Sputnik III. The data which have been obtained have been compared with the scheduled passes of the satellites, as well as with the Doppler signal recorded from Sputnik III's transmitter. All these

data still need plenty of analysis before we will get the rest of the answers.

Results on Discoverer I

The study was recently interrupted to apply the not-yet-proven technique to the lost satellite Discoverer I. This was done because the radio of the satellite was for all practical purposes unable to report the satellite's position, and the orbit plane was such that the satellite was not visible over most of the area of the earth. Day and night listening periods were set up in Ithaca and Schenectady, New York. In Ithaca the help of K2VMH and W2KRF was obtained to ease the strain of the long and late listening times. In Schenectady wonderful cooperation was obtained from W2ODC, W2DAG, K2QIX, and W2ZHI. Additional support was received from W2DSB in Johnson City, and from WITSN and WINXY in Boston.

Extremely good results were obtained using the 10-Mc. reflected signals. For a period of over two weeks consistent returns were obtained that matched very closely the orbit predicted by the Air Force from the launch data. The rumble effect was very consistent. The Doppler returns, although not obtained on every pass of the satellite, definitely existed and at times lasted for periods up to 5 minutes.

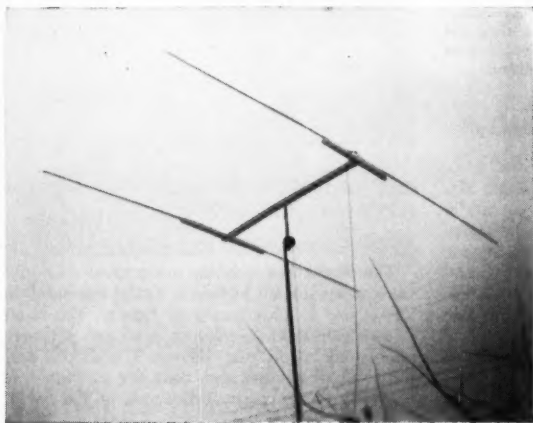
The project is now being continued using the facilities of General Electric Company to gather more and better data, in order to determine the exact cause of the phenomena. However, from the results obtained so far, it appears that the observed signal disturbances are definitely correlated with actual satellite passes, and that each satellite builds and carries along with it a cloud of ionized particles.

Q57-

Strays

The Boy Scouts International Bureau in Ottawa has announced the Second Annual Jamboree-on-the-Air, from 0001 GMT Oct. 23, to 2400 GMT, Oct. 25. Scout hams are invited to exchange greetings. This is not a contest and there is no prescribed exchange. Any bands may be used. Special QSLs will be sent from the International Bureau station and K2BFW, the *Boys' Life* Radio Club station. For more information, contact Harry Harchar, W2GND, *Boys' Life* editor and Boy Scouts of America coordinator.

- *Beginner and Novice –*



**A TV rotator easily handles
the simple 15-meter beam.**

Simple Beam

Construction

for 15 Meters

Adding a Reflector to the One-Element Rotary

BY CHARLES D. THOMPSON, JR.,* W4UVY

The 2-element 15-meter beam described here by W4UVY takes little space and is easily constructed. It's an inexpensive way of tripling your effective radiated power.

ONE of the simplest methods of obtaining a unidirectional field pattern is by means of a parasitic array, which consists essentially of a half-wave dipole associated with one or more parasitic elements; i.e., reflectors and directors. It is characteristic of parasitic-element systems to show maximum radiation in one direction.

* 208 East 11th Ave., Johnson City, Tennessee.

This helps to reduce interference in directions other than that over which communication is being carried on.

One of the simplest and least expensive methods of constructing such an array is the one to be described. As shown in Fig. 1, this antenna consists basically of the "One-Element Rotary"¹ used as the driven element with an added parasitic element. The parasitic element is longer (tuned to a lower frequency) than the driven element and is therefore a reflector and reinforces radiation in the direction of a line pointing away from itself toward the driven element.

Elements

The same type material and general configura-

¹ QST, Jan. 1959; ARRL *Handbook*, 1959 Edition.

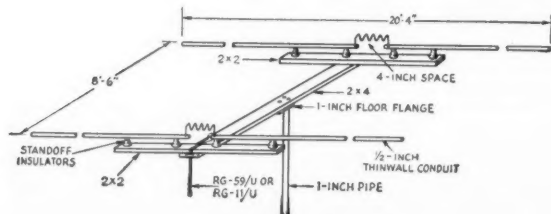
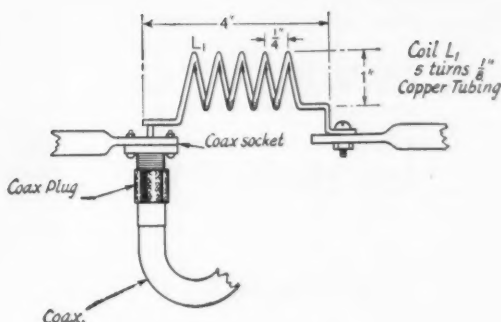


Fig. 1—Sketch showing the construction of the simple 15-meter 2-element beam. Loading-coil dimensions are given in the text.

Fig. 2—Detail showing method of attaching coil and coax connector to driven-element members. The reflector coil, slightly larger, is bolted directly to the tubing at both ends.



tion are used for the construction of both elements. Each element is made by using two standard 10-foot lengths of $\frac{1}{2}$ -inch diameter electrical thin-wall conduit. The 20-foot length is short for a half-wave driven element or a parasitic element for the 15-meter band and therefore the elements must be effectively lengthened by the addition of lumped inductance. This loading is accomplished by the use of center coils.

For those who might not have access to the referenced publications,¹ some of the general construction details will be repeated here.

Loading Coils

As shown in Fig. 1, the two lengths of conduit for each element are supported on four stand-off insulators on a 4-foot 2×2 . Mounting points for the coils and coax connector are made by flattening the ends of the tubing for a length of about $1\frac{1}{2}$ inches, as shown in Fig. 2.

The coil for the driven element is made of $\frac{1}{8}$ -inch copper tubing. It consists of 5 turns spaced $\frac{1}{4}$ inch apart and has an inside diameter of 1 inch. This coil is connected in series with one length of the conduit to the center-conductor pin on the coax fitting. To secure a good connection at the coax fitting, care should be exercised in the soldering. The other end of the coil is connected to the conduit with a screw and nut.

The coil for the reflector is also constructed of $\frac{1}{8}$ -inch copper tubing. It consists of 6 turns, 1-inch inside diameter, turns spaced $\frac{1}{8}$ inch apart. This coil is connected directly between the two lengths of conduit with screws and nuts.

Conduit or tubing could be used for the boom with possibly a slight weight reduction and gain in mechanical stability. However, the 2×4 wood boom has withstood East Tennessee environmental conditions very well and a small TV rotator has proved adequate for rotation.

Antenna Mast

The spacing between the elements is 8 feet 6 inches. The antenna is mounted on the mast by securing a 1-inch floor flange to the center of the 2×4 boom by means of three 2-inch bolts as shown in Fig. 1. The floor flange is connected to a 12-foot length of 1-inch pipe. This is inserted 6 feet into a 21-foot length of $1\frac{1}{4}$ -inch pipe which

serves as a mast. A hole that will clear a $1\frac{1}{4}$ -inch bolt is drilled through the mast pipes approximately 1 foot from the top of the larger pipe. Then a $1\frac{1}{2}$ -inch bolt is slipped through the hole and secured by a lock washer and nut. The 1-inch pipe is cut and a rotator installed or, by the use of bearing sleeves at the mounting points, the entire mast could be rotated by hand.

Feeding the Beam

Tuning of the reflector affects the feed-point impedance of the driven element as well as the gain and front-to-back ratio. In this instance, it was found that the tuning was such as to provide a good match to 72-ohm line.

The spacing and tuning of the elements are factors in determining the gain of an antenna-reflector combination. The reflector does not require connection to the driven element or associated circuit. When the driven element is energized, the resultant field induces a current in the reflector in such phase (in this particular instance) that the fields of the two elements in a direction from the reflector through the driven element combine to increase the total radiated power in that direction.

For transmitters having a pi-network output circuit capable of matching a 72-ohm load, coupling is just a matter of adjusting the network to the point where normal loaded plate current is obtained. For transmitters whose output circuit is designed to operate into an impedance which differs greatly from the 72-ohm value, an impedance-matching network must be inserted between the transmitter and the transmission-line input.

QST

MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of QST without interruption.

A 75-Watt V.F.O.

for 20-40 C.W.

A Specialized Rig

for the Code Man



Although not miniaturized, this five-stage transmitter-cxciter is in a cabinet measuring only a shade over 11 inches wide, 5½ inches high, and 8½ inches deep. It covers the 7- and 14-Mc. c.w. bands with v.f.o. and has a 6146 final stage.

BY GILBERT L. COUNTRYMAN,* W4JA, EX-W3HH

Although the author calls this a "v.f.o.", it has enough power output to qualify as a transmitter in its own right. It is designed especially for c.w. work — not, as are many transmitters, primarily for phone with a key jack added almost as an afterthought. Concentrating on one aspect of operating simplifies construction despite the fact that there are five stages from v.f.o. to final.

JUDGING by the author's correspondence during the past year, there are numerous old-timers who prefer to pound brass, usually sticking to one or two bands. They keep a few schedules with friends or relatives, and other operating time is devoted to rag-chewing, DX, contests and traffic as time will permit. They take pride in their notes, keying characteristics and ability to handle a bug. Several have expressed interest in a simple 75-watt transmitter, for use on one or two c.w. bands, which could also be used to drive a high-power amplifier. The exciter to be described fills these specialized requirements, while the basic design is applicable to phone as well as c.w.

Many of the v.f.o. circuits used today, although satisfactory for phone, are marginal for c.w. use; and many published circuits with sufficient stability and bandspread for single-sideband make inadequate provisions for c.w. keying. The same holds true for manufactured transmitters, which variously feature time-sequence keying, differential keying, "modified" grid-block keying

(whatever that is) and so on, but as heard on the air only a few of these transmitters have what the writer feels can be considered acceptable keying.

To permit the use of the builder's pet key-thump filter or electronic keyer, no provisions for wave shaping have been included in the unit to be described. The exciter features:

- 1) Simple construction using only stock components.
- 2) A stable v.f.o. with adequate bandspread for any use.
- 3) Compactness, but not to the extent that construction becomes a chore.
- 4) Selection of the 20- or 40-meter c.w. bands at the flip of one s.p.s.t. switch.
- 5) No TVI.
- 6) Essentially single control.
- 7) Output up to 75 watts as desired.

An 80-meter v.f.o. is followed by an untuned isolation stage. Next is an isolation amplifier fixed-tuned to the center of the 40-meter c.w. band. This drives a fixed-tuned 5763 that operates either straight through on 40 meters or doubles to 20. The final, a 6146, runs straight through on both bands. Only one setting of the plate tank capacitor of the 6146 is necessary for the band selected. This stage could not effectively be made fixed-tuned, however, because of the detuning effect of different loads that may be applied to its output circuit.

The V.F.O. (6C4)

A high-*C* Colpitts oscillator was decided upon, and originally it was planned to use permeability tuning. A coil wound on a Millen 74001 form mounted horizontally in an octal socket worked to perfection and the bandspread was ideal, two complete revolutions covering the 20-meter c.w. band. Unfortunately, the coefficient of expansion

*Captain, U. S. Navy, 75 East Bay St., Charleston, S. C.

of the powdered-iron slug was so great that the frequency drift could not be compensated. The best result obtainable, an 8-ke. drift downward over a period of 70 minutes (2 ke. on the fundamental frequency) was, of course, unacceptable. Permeability tuning was regrettably abandoned. If anyone is interested in further experimenting, one oscillator coil consisted of 10 turns of No. 20 enameled wire, close-wound in the center of the coil form. Other components were the same as shown in Fig. 1, except that approximately 560 $\mu\text{mf.}$ fixed capacitance paralleled the inductance in lieu of the variable capacitor. Another grid coil used 13 turns of No. 26, with no shunt capacitor. The 3/16-inch hex nut termination of the core screw is easily secured to a 1/4-inch shaft coupling by drilling another hole in the shaft coupling, threading it for an 8-32 screw and centering the core screw in the coupling. This was necessary to eliminate shaft eccentricity. A 3/16 to 1/4-inch split bushing also could have been used.

The oscillator tube is a 6C4. The output is taken directly from the grid, which is rather unconventional, but resulted in improved oscillator stability as compared with taking the output from the plate cathode, or directly from the tuned circuit. With the component values shown in Fig. 1, from a cold start the v.f.o. has an upward drift of 200 cycles over a 10-minute period and thereafter the drift is negligible.

A direct-reading v.f.o. dial calibration is operationally unnecessary because a v.f.o. is normally set to a receiver frequency. A 5-to-1 ratio National Velvet Vernier dial is used. If direct-reading calibration is desired a Lucite pointer can be made to replace the four-inch dial, which can be removed from the Velvet Vernier mechanism by unscrewing three bolts under the knob. A calibrated chart can then be fastened to the panel with masking tape.

With the components shown, 180 degrees on the dial just covers the 40-meter c.w. band, which gives adequate bandspread on both 40 and 20. Changes in the inductance and tuning capacitance can be made to give any bandspread desired.

Isolation-Doubler Stages (6AU6s)

The first 6AU6 isolation stage runs with low driving voltage. Its output can be grounded with no perceptible change in the oscillator note.

The second 6AU6 has a broadly tuned plate tank centered on 7050 ke. It provides additional isolation and has sufficient amplification to drive the 5763 both straight through and doubling to 20 meters. Isolation of the first three stages is promoted by regulated plate voltage, r.f. chokes in the high-voltage and heater leads, and bypassing the heaters of these three tubes at the sockets.

The 50-ohm resistor in the plate-supply lead of the second 6AU6 was included to permit clipping an external milliammeter across it so the core in the plate coil, L_2 , could be adjusted to give a dip in the plate current with the v.f.o. set at 3525 ke. This adjustment, which fix-tunes the stage at 7050 ke., is quite broad so the effect of heating in the core may be disregarded.

A panel switch, S_1 , cuts in the first three stages for v.f.o. spotting in the receiver. This switch is paralleled by a Millen statite two-terminal strip at the rear of the chassis, for connection to the send-receive remote-control system.

Driver (5763)

The 5763 has an excitation control in its screen circuit to provide adjustment for proper grid current to the 6146. This control is on the chassis and is not brought out to the front panel. It is set once and forgotten.

One unique feature of this rig is found in the 5763 plate circuit where, by an appropriate LC

This inside view shows that there is no crowding above the chassis. The v.f.o. is at the right near the panel, with the first and second 6AU6 stages toward the rear edge. The 5763 is in the center of the chassis. The amplifier tube and circuit are at the left. The 2 X 4 X 4-inch box on the panel houses the milliammeter.



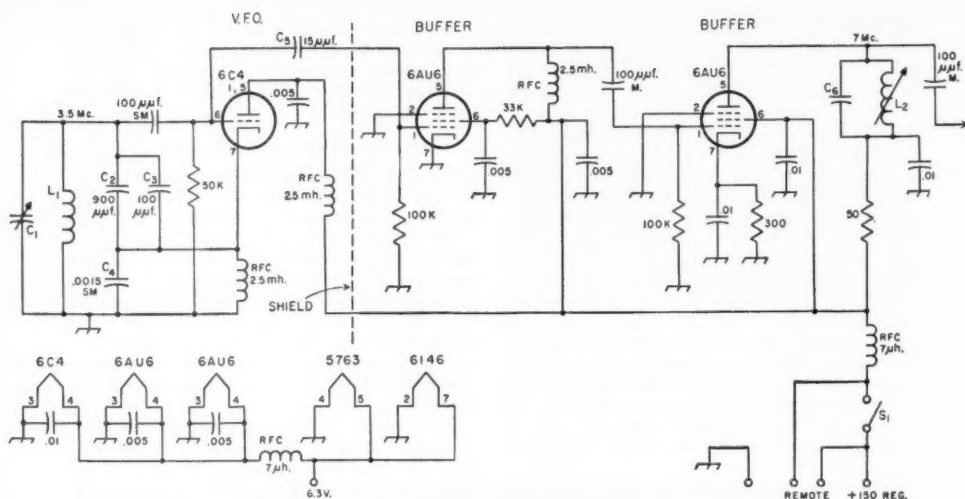


Fig. 1—Circuit diagram of the transmitter. Unless otherwise indicated, capacitances are in $\mu\text{f.}$, resistances are in ohms, resistors are $\frac{1}{2}$ watt, 0.005- and 0.01- $\mu\text{f.}$ bypass capacitors are disk ceramic; for other fixed capacitors M = mica, SM = silver mica, 7- $\mu\text{h.}$ r.f. chokes are Ohmite Z-50; 2.5- and 1- $\mu\text{h.}$ chokes are standard pie-wound.

- C₁—35- $\mu\text{f.}$ variable (Hammarlund MC-35-S).
 C₂—900- $\mu\text{f.}$ silver mica.
 C₃—100- $\mu\text{f.}$ N750 neg.-temp.-coeff. ceramic.
 C₄—0.0015- $\mu\text{f.}$ silver mica.
 C₅—15- $\mu\text{f.}$ zero-temp. coefficient ceramic.
 C₆—25- $\mu\text{f.}$ ceramic.
 C₇—3-12- $\mu\text{f.}$ zero-temp.-coefficient ceramic trimmer (Centralab 822FZ).
 C₈—91- $\mu\text{f.}$ zero-temp.-coefficient ceramic.
 C₉—200- $\mu\text{f.}$ variable (Hammarlund MC-200-M).
 J₁—Open-circuit jack.
 J₂—Coaxial connector, chassis-mounting.

- L₁—10 turns No. 20 enam., close-wound on 1-inch form (see text).
 L₂—No. 26 enam., close-wound, length 11/16 inch, diameter $\frac{1}{2}$ inch, on slug-tuned form (National XR-50).
 L₃—Same as L₂ except No. 18 enam.
 L₄—4 turns No. 26 wound on 50-ohm 2-watt carbon resistor.
 L₅—12 turns No. 18, diameter $1\frac{1}{4}$ inches, turns spaced wire diameter; link 3 turns at ground end.
 R₁—25,000-ohm 3-watt control, wire-wound (Clarostat).
 S₁, S₂—S.p.s.t. toggle.

combination, an s.p.s.t. switch, S₂, is used to put the transmitter on either the 20- or the 40-meter band. Adequate drive, and the same amount, is furnished to the 6146 on both bands. The plate tuning of this stage is also quite broad, so the use of an iron-sluge core for inductance adjustment is feasible.

Amplifier (6146)

The 6146 may be operated at any input up to 90 watts, depending upon the plate voltage used. The grid current is measured when initial adjustments are made, by using a low-range external milliammeter across the 50-ohm resistor provided at the grounded end of the grid circuit.

A simple link-coupled output circuit suffices since the rig is normally used as a driver for a high-power amplifier, to which it is connected by a length of RG-58/U or RG-59/U coaxial cable. If it is run "barefooted," an antenna coupler should be used anyway for harmonic suppression, so the additional control for a pi-network output was not considered to be justified.

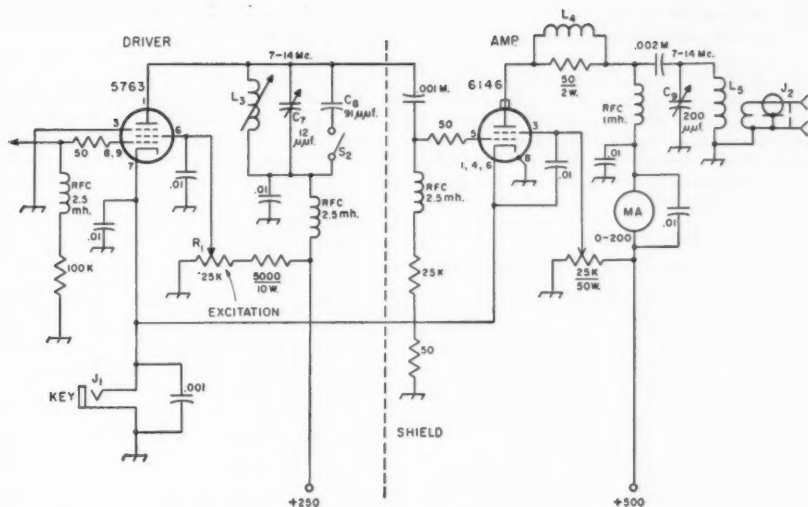
The link winding around the ground end of the plate coil is ordinary push-back wire and has one end connected to a grounded soldering lug bolted to the chassis. The free end runs on top of the chassis to a point directly over the coaxial

socket, where a National through-bushing takes it down through the chassis. It is then soldered to the center terminal of the coaxial socket. This was done to keep all plate wiring above the chassis and the grid circuits below.

The slider on the screen voltage divider should be set at about the midpoint to give a key-down screen voltage of 125 volts with a plate voltage of 500 (the 6146 should be loaded to normal input when this adjustment is made). This setting will not have to be changed if the high voltage is increased to 700 volts or so. When the photo was taken this resistor had been removed to the power supply to eliminate one source of heat, but no operational improvement was noted. It may be located under the chassis, close to the right-hand side, running from front to back. About four 3/16-inch ventilating holes should be drilled in the chassis directly over it.

Keying

The last two stages are simultaneously cathode-keyed to avoid difficulties with the 6146 and to eliminate the need for a clamper tube for protection as would be necessary if oscillator keying were used for break-in. True break-in, the ability to break a station while it is transmitting, is used by so relatively few c.w. stations



that the added circuit complexity hardly made its inclusion worth while.

By keying the last two stages simultaneously, the wave form can be shaped as desired. Fig. 2 shows one simple key-click filter used by the author which can be adjusted for near-perfect keying without clicks or chirps. A simple but highly effective vacuum-tube keyer was described by the author on page 59 of *QST* for February, 1957. Merely connecting a 5- to 10- μ f. electrolytic capacitor across the key, being sure to maintain the proper polarity, results in keying superior to the average c.w. signal on the air today.

Power Supply

No power supply is included because many amateurs have suitable supplies available. More important, with an external power supply the v.f.o. heat problem is simplified. The 250 volts for the 5763 is obtained from a 50-watt 8000-ohm series-dropping resistor located in the power supply. Connections between the exciter and power supply are through a multiconductor cable plugging into sockets on the rear of each unit. The high-voltage transformer used should have an adequate current rating —200 ma. or more. The author uses a Stancor P8041. Either 500 or 650 volts under load is available by turning a ceramic switch that shorts out the first choke in the filter, changing it from choke to capacitor input.

Construction Notes

Normal precautions should be taken when wiring the grid circuit of the v.f.o., although the high- C Colpitts circuit is nowhere near as fussy mechanically as a Clapp oscillator.

No miniaturization was attempted but the cabinet is only 11 $\frac{1}{8}$ inches wide by 5 $\frac{1}{2}$ high and 8 $\frac{5}{8}$ deep. The cabinet and chassis foundation is a stock item made by the California Chassis

Company,¹ their No. LTC-470. The cabinet is removed by unscrewing only two 10-32 machine screws at the rear of the chassis. Rubber feet on the base of the cabinet protect the table top, improve ventilation and assist in minimizing susceptibility to shock.

The shielding around the v.f.o. components below the chassis is provided by a $4 \times 4 \times 2$ -inch aluminum utility can with top and bottom plates removed. The can is fastened to the chassis with the sheet-metal screws that come with the box. One of the unused 4-inch square plates is cut down and bent and used for the shield between the 5763 and the 6146 stages underneath the chassis. The 3-12- μ f. ceramic trimmer in the plate circuit of the 5763 is mounted on this shield. The other utility box plate is similarly cut and bent and used on top of the chassis between the 5763 and the topside of v.f.o. parts.

Tie points are used liberally to facilitate the mounting of components. Shake-proof washers are used with every machine screw. It is necessary to insert washers between the front panel and chassis to take up about 3/32 inch of slack if the LTC-470 unit is used. These are placed on the two machine screws at each end of the front panel and on the two switch shafts.

The meter hole was easily cut with a 2¼-inch punch. The meter shield was made by cutting down an unfinished aluminum utility can 4 × 4 × 2 inches. The type with detachable front and back plates can easily be arranged to fit between the chassis and the cabinet top. This shielding proved to be more effective than the often-used cut-down tin can with fluted edges. Any enamel on the inside of the panel must of course be removed to give good r.f. contact with the meter shield. Meter manufacturers are missing a good bet by not copper plating the case

¹ 5445 E. Century Blvd., Lynwood, Cal.

and the inside of the flange.

Rear chassis connections include a key jack, coaxial r.f. output socket, remote v.f.o. control terminal strip, and power connector. The front panel has only the v.f.o. dial, v.f.o. switch, milliammeter (0 to 200 ma.) the 20/40 switch, and a knob to tune the plate circuit of the 6146 to either 20 or 40. Only one adjustment to the dip in plate current is necessary for coverage of the band selected.

Initial Testing

Each stage should be wired and tested before proceeding to the next stage. No difficulties were experienced with this transmitter until the 6146 stage was added, and the trouble here was eventually traced to an open circuit in the 2.5-mh. choke in the grid circuit. The author had neglected the normal precaution of testing all r.f. chokes for continuity before wiring them in the circuit.

Adjustments

Necessary adjustments are summarized for convenience:

6C4 — With the values shown in Fig. 1 it is only necessary to adjust the coil winding very slightly, forcing a few end turns apart and pushing them closer together until the v.f.o. signal is heard with the receiver set to 3500 kc. and with the v.f.o. tuning-capacitor plates fully meshed. It is convenient to put a few drops of coil dope on the winding and make the adjustment after 10 or 15 minutes, when the coil dope has started to harden but before it has set firmly. This maintains the exact wire spacing desired.

Second 6AU6 — The core of the plate coil may be adjusted to approximately 7050 kc. with a grid-dip meter after it is wired in the circuit. Then set the v.f.o. on about 3525, connect a milliammeter across the 50-ohm resistor in the

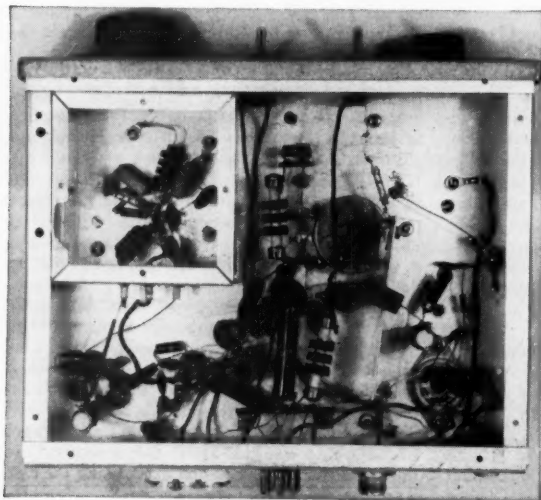
plate circuit, and adjust the core to the dip in the plate current.

5763 and 6146 — Attach a 25-watt light bulb to the amplifier r.f. output coaxial socket. Set the v.f.o. at midscale. Connect a milliammeter across the 50-ohm resistor next to ground in the grid-return lead of the 6146. Set the excitation control to maximum. Close the v.f.o. switch, close the key, and adjust the core of the 5763 plate coil and the ceramic trimmer capacitor, C_7 , for maximum grid current with the 20/40 switch open. Tune C_9 for minimum plate current with the plates of the tank capacitor about one-fourth meshed. Now close the 20/40 switch and retune the 6146 plate tank to the dip near maximum capacitance. The grid current should be the same as before. If not, adjust L_3 and C_7 until the grid current is the same whether the 20/40 switch is open or closed. Any value between 1.5 and 3 ma. will be satisfactory. If the current is over 3 ma., back off the excitation control. Watch the plate current of the 6146. With the light-bulb load the plate current should dip to about 30 ma. on both 20 and 40 and should be the same value for both bands. With the three-turn output link the 25-watt bulb will light to about one-half normal brilliancy and with the same intensity on both bands. Maximum bulb brilliancy will not quite coincide with maximum dip in the plate current. This is normal.

This completes adjustment of the last two stages. For 20 meters merely open the 20/40 switch and set the final tank to the dip in the plate current at low capacitance. For 40 meters close the 20/40 switch and adjust for the dip at high capacitance. The 6146 will load up to 125 to 150 ma. when connected to a high-power amplifier or to an antenna through an antenna coupler.

TVI-Proofing

After all components are wired in place and



V.f.o. components are shielded by the $2 \times 4 \times 4$ -inch box at the upper left in this bottom view. The control on the chassis at right center is the excitation adjustment, setting the screen voltage on the 5763 driver.

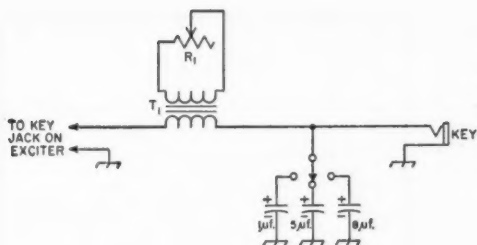


Fig. 2—Keying wave-shaping circuit. T_1 is a 6.3-volt filament transformer with primary in keying line and R_1 , a 300-ohm control, connected across the 6.3-volt winding. The setting of R_1 determines the "make" shaping. The switch and capacitor values determine the "break" shaping; capacitors may be either electrolytic or paper, and other values may be used for a desired characteristic.

testing is completed, a grid-dip meter should be used to determine whether there are any resonances near the TV bands as such resonances can result in TVI. In the case of the 6146, a strong resonance point was found near the plate of the tube and its r.f. choke at about 56 Mc., which almost certainly would have loused up Channel 2. The solenoid type r.f. choke originally installed was removed and a 1-mh. choke with pie windings was substituted. The resonance disappeared.

A Z-50 choke had been included in the keying lead at the jack and the key jack had been bypassed by a 0.01- μ f. ceramic disk capacitor. A fairly strong resonance was found at the key jack on 78 Mc. and on-the-air test showed serious cross-hatching on Channel 5. Removal of this r.f. choke and changing the key bypass capacitor

to a 0.001- μ f. ceramic disk stopped the interference without detriment to the rig's performance.

Every transmitter is different, unless built to factory production-line techniques, but the above steps are representative of those necessary to de-TVl any transmitter.

The rig has proved to be 100 per cent reliable in all respects and operation is a pleasure. The note is consistently reported as T9 with the LCR filter shown in Fig. 2.

One final word of caution: Remember there are 150 volts on the exposed remote terminal at the rear of the chassis, and although one side of the key is grounded there are some 110 volts across it, key open. Just don't use both hands to adjust your bug with the rig turned on! **QST**

Strays

Last March the Aruba Amateur Radio Club held a field day and subsequently had a fine write-up on it in *Aruba Esso News*. As these photos show, field day is just about the same no matter where it's held. At the left PJ2AQ operates the transmitter at one of the stations while PJ2AK manipulates the receiver. At the right is the sort of organized confusion that all of us have taken part in at one time or another—the gang helps PJ2AF erect a beam. There were twelve stations active during the 24-hour test, and emergency gear got a good workout.



25 Years Ago this month

August, 1934

... Big news this month was the announcement of mobile privileges on the 56-60 Mc. band and above 110 Mc.
... Grammer and Hull described new equipment for the 56-Mc. station, including a stabilized transmitter and a non-radiating receiver.
... L. W. Hatry gave forth with some pointers on noise-reducing antenna systems.
... J. N. A. Hawkins, then W6AAR, contributed one of the all-time great QST humor stories — entitled "Behind the Scenes With Next Year's Model."
... Other technical contributions included a medium-powered phone-c.w. transmitter with pentodes (W1RF and W1HTM), a four-band transportable phone and c.w. transmitter (W9FVM), and four pages of hints and kinks for the experimenter.
... The IARU news column summarized pertinent amateur regulations throughout the world.
... And J. H. Dellinger, Chief of the Radio Section of the U. S. Bureau of Standards, discussed long-delay radio echoes and how amateurs could participate in special observations of these phenomena.

Strays

Since last month's issue, high claimed c.w. scores ranging from 200,000 to 500,000 points have been reported by CN8JE, DJ2HC, DJ3KR, EA8BF, JA1VX, OK3EA, VK2GW, VK5NO, and ZL1NG in the 1959 ARRL DX Test. Also, excellent phone tallies from 80 to 300K are claimed by CN8JE (multiop), EA3JE, OZ2JF, and ZL1NG.

W1VG likes to call this his "heel-and-toe" WAC. Pete says he's been working on it for a good many years and for 6000 QSOs. If the significance of the photo escapes you at first, kindly note that the sequence is something like this, "VK3JA1CR7LU9DL6VE6VK3JA," etc., etc. No, the IARU office did not issue a special endorsement for this!



Silent Keys

It is with deep regret that we record the passing of these amateurs:

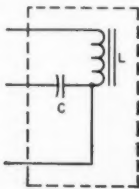
W1CGQ, Charles A. Parker, Hyannis, Mass.
W1FJM, Walter E. Pupecki, jr., Pawtucket, R. I.
W1FRD, Clarence Adams, Canaan, Conn.
W1ITF, George M. Cole, Northwood Center, N. H.
K2AE, Henry Primm Broughton, Schenectady, N. Y.
W2PFE, Harold J. Schuler, Orange, N. J.
W2ZPN, Joseph Derivan, Yonkers, N. Y.
K2ZXM, Robert J. R. Buchanan, Huntington, N. Y.
W3ACM, Earl A. Merryman, West Lanham Hills, Md.
W3BFX, LeRoy A. Jewell, Cumberland, Md.
K3CTU, Dr. Harvey L. Fuller, Baltimore, Md.
W3ZT, Alfred B. Cook, College Park, Md.
ex-W4EKH, John Nance Hall, Vienna, Va.
W4JTF, Leland D. Gash, Miami, Fla.
W5BLG, Hervia K. South, Portland, Tex.
W6CAM, H. D. Worthington, Downey, Calif.
W6TCI, Walter Lenz, Redwood City, Calif.
W6ZZ, Miles Weeks, Menlo Park, Calif.
ex-W8COV, Richard E. Hana, sr., Milford, Ohio
W8ICD, Charles A. Smith, Bucyrus, Ohio
W8JBP, John P. Old, jr., Saulte Ste. Marie, Mich.
W8UQO, Arvy W. Wagner, Ann Arbor, Mich.
K9ILS, A. F. Stockberger, Canton, Ill.
W8SGG, Otto L. Woolley, Colorado Springs, Colo.
G8DC, Herbert M. Tee, Burnley, England

Quist Quiz

Jack Bacon, W8NCG of Columbus, Ohio, keeps the puzzles popping with the following, which he credits to a friend at the O.S.U. Antenna Laboratory:

You have two items, a "black box" with N (any large number of) terminals on it and an ideal (perfect) r.m.s. voltmeter. Tests with the voltmeter show that when the meter is connected between any two of the terminals on the box, the meter reads the same. The problem: What is in the box? (No, smarty, the meter reading is not zero when connected to any pair of terminals, and it is zero when the meter isn't connected.)

The answer to last month's Quiz is shown below. L and C resonate at 60 cycles; when both switches are closed a parallel-tuned circuit is formed that holds down the current flow.



QST for

• Recent Equipment —

Heathkit Single-Sideband Adapter SB-10

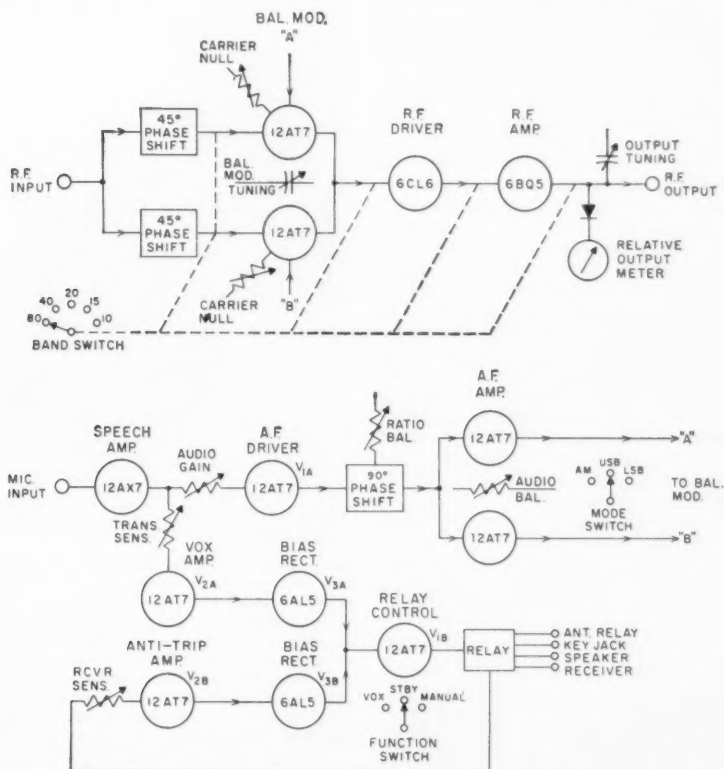
WE'RE not sure that "adapter" was the wisest choice of names for this auxiliary sideband unit produced by the Heath Company, since the word is often used along with "converter" or "slicer" to designate a receiving gadget. You may have to read the fine print in the ads to realize that this is a transmitting accessory, designed specifically as a companion piece to the Apache transmitter,¹ converting its output to sideband. The instruction book also contains modification details on how to set up the DX-100 transmitter series to accommodate the SB-10 (a separate kit may be purchased for this purpose).

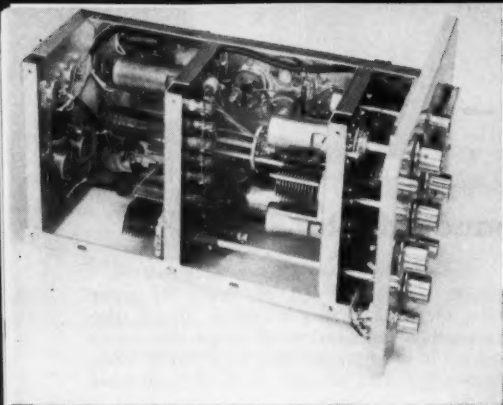
Perhaps the most attractive feature of the unit, from the standpoint of an amateur already possessing an a.m. transmitter, is that it makes use of existing r.f. circuitry already in the com-

panion transmitter, and also draws its power from the same source. We see no reason why appropriate modifications of comparable transmitters of other manufacture could not be made to accommodate the unit to achieve sideband output.

A block diagram of the SB-10 is shown in Fig. 1. Nine tubes are employed, all but two performing dual functions. Using the phasing method of sideband selection, the SB-10 takes r.f. from a driver stage in the transmitter and splits it into two components, which are then each shifted 45 degrees by RC networks for a total of 90 degrees. The single-sideband signal is generated at the output frequency of the transmitter. For each band, an entirely different network of precision capacitors is switched in to provide the proper phase shift at each operating frequency. Approximately 3 watts of r.f. drive power is required.

¹ QST, March 1959, page 44.





A compact, neat layout of components and chassis is shown in this bottom view of the SB-10 (one reinforcing aluminum angle was removed for the photograph). The small section immediately behind the panel contains r.f. phase shift and balanced modulator input circuits. The center section houses the balanced modulator output circuits and the broadbanded r.f. driver stage. The rear section contains the bandswitched output stage and rear-panel components.

The band switch, controlled from the front panel, allows switching the unit to any amateur band from 80 to 10 meters in a single operation.

Separately, the audio signal, which has been amplified in three stages, is split into two signals 90 degrees apart in passing through a B & W 2Q4 phase-shift network. These signals then go into separate audio amplifiers. The r.f. and a.f. signals are next fed to a pair of balanced modulators in proper phase so as to permit cancellation of the carrier and one sideband. Here, a switching system permits selection of upper or lower sideband, or both for a.m. The sideband signal is then amplified by a 6CL6 broadbanded r.f. amplifier stage which is followed by a tuned 6BQ5 (EL84) amplifier with a pi-network output tank. Both the driver and amplifier are operated Class A. Relative power output and carrier nulling are indicated by a panel meter connected to the final r.f. amplifier stage.

Output from the amplifier is rated at 10 watts p.e.p., which is adequate to drive a pair of 6146s in the function for which the unit was designed. Both input and output of the SB-10 are designed for low-impedance coaxial line connections.

In addition to generating the s.s.b. signals, the SB-10 also has built-in audio and control circuits which include provision for manual or VOX operation, and an antitrip amplifier working from the receiver output. A 12AT7 relay control tube operates a relay whose contacts connect at the SB-10's rear apron, to mute the receiver speaker circuit. A line from the key jack of the transmitter is also connected to the relay contacts to close that circuit when the relay operates. Auxiliary relay contacts are available for controlling an antenna relay.

Several controls, normally needing only initial adjustments, are internal or are on the rear of the cabinet. These are the ratio balance control in the cathodes of the audio output tubes, and the sensitivity controls for both VOX level (transmitter sensitivity) and antitrip level (receiver sensitivity). Front-panel controls include the band switch, balanced modulator tuning, carrier null controls, output tuning, sideband selector (mode switch), audio gain, and VOX-standby-manual function switch. Sufficient broadbanding is employed in the r.f. circuits so that

normal frequency excursions in one band may be made without the necessity for SB-10 readjustments.

Assembling the unit required 18 hours of work, in this instance by a constructor already familiar with kit techniques. The only difficulties encountered were a couple of instances of clearance problems, but fortunately these were covered by adequate cautions in the assembly instructions. We did find that the control shaft extensions



Rear view of the SB-10, removed from its cabinet. This main (top) deck contains the audio and control circuits. The B & W phase-shift network is at the center right, having the appearance of a metal tube shell. Immediately behind it are the audio balance and ratio balance controls, needing only initial adjustment. On the rear panel, the octal male plug provides power connections, normally obtained through an accessory socket on the transmitter. The Amphenol coax fittings are used for r.f. input-output connections while the six-post terminal strip connects to the control relay contacts.

through the front panel are barely of sufficient length, and one has to be certain the knob set screws get an adequate bite on the shafts.

The manufacturer states that unwanted side-band suppression is in excess of 30 db. and carrier suppression is in excess of 40 db. The unit normally obtains power from its companion transmitter through an accessory socket. Its requirements are 6.3 volts a.c. at 3.5 amp., and 350 volts d.c. at 30 ma. on standby and 140 ma. when delivering rated output.

The instruction book contains assembly and tune-up instructions, the latter being specifically in connection with the Apache transmitter, which uses two 6146s in the final stage. We find it a little hard to understand the recommendations

for a.m. linear operation (page 56); the input figures given seem far too high, considering the rated plate dissipation of the 6146s. Also, Fig. 21 on the same page, a simulated scope pattern showing a.m. ripple on an s.s.b. single-tone signal, repeats an error which crept into a formula when this type of pattern was discussed in September 1955 *QST* (the correct formula was subsequently given in the November 1955 issue).

The SB-10 is 10 inches high, 6 $\frac{3}{4}$ inches wide, 13 inches deep, and occupies a minimum of operating table space. We feel we should mention that several YLs and XYLs, normally unimpressed by radio gear, on seeing the unit spontaneously remarked that it was unusually handsome.

— J. H.

The Transtech 432T

HERE is a tripler-amplifier for the v.h.f. man who has a 144-Mc. r.f. source and wants to work on 432 Mc. It is similar in several respects to equipment for this purpose that has appeared in the ARRL *Handbook* for the past several years, but it has some interesting electrical and mechanical innovations. The Transtech 432T (Transtech, R.F.D. 1, Hopewell Junction, N. Y.) is capable of taking the legal limit of 50 watts input on 432 Mc. easily, and it can be driven by any 144-Mc. transmitter having an r.f. output of 5 watts or more.

Two 5894 dual tetrodes are used. The tripler has a coil grid circuit that resonates in the 2-meter band with the input capacitance of the tube. Silver-plated copper strip lines are used in the plate circuits, and in the final grid circuit, in the manner of the *Handbook* 432-Mc. rigs. Output coupling is done with capacitor plates of the same stock, terminated in a half-wave balun, as shown in Fig. 1. A relative indication of power in the

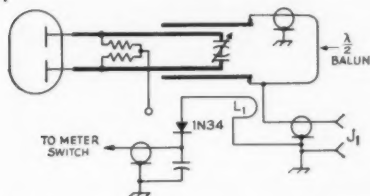


Fig. 1—Schematic diagram of the amplifier plate circuit, showing output coupling system.

coaxial line is given by an r.f. voltmeter, the circuit of which is also shown in Fig. 1. The coupling loop, L_1 , for the voltmeter is simply the lead to the 1N34 rectifier, bent near to the hot terminal of the coaxial output fitting, J_1 .

Users of the 5894 and other tubes with plate



The Transtech 432T is a tripler-amplifier for 432-Mc. operation. Driver may be any 144-Mc. transmitter capable of 5 watts output or more.

wires protruding through the top of the glass envelope may be interested in the method used in the Transtech 432 for making the plate connection to the tuned line. A thin strip of silver-plated sheet copper 7/16 inch wide is bent as shown in Fig. 2. A short tab of the same material, similarly bent, is bolted against the pin on the other side. Anyone using this system is cautioned to line up the plate lines with care; though the top of the tube envelope is made of fused glass it should not be called upon to withstand appreciable twisting or pressure. Bending the strips used

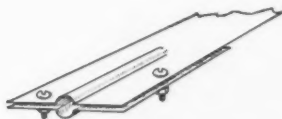
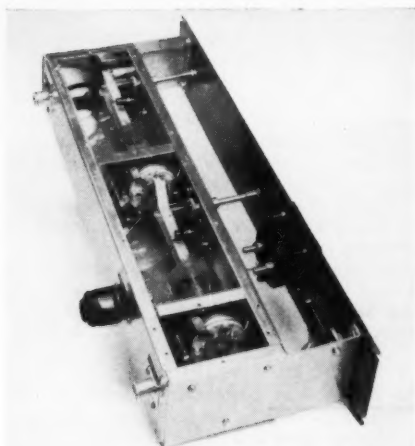


Fig. 2—Method of making connection to the plate terminal rods of the 5894 tubes used in the Transtech 432T. Flat silver strap used for the plate line is bent to fit around the rod at the top of the tube envelope, and a short piece of stock similarly bent is bolted to the plate line, making a tight fit on the rod.



Interior view of the 432-Mc. transmitter, showing silver-strap tuned circuits. Note method of mounting chassis, leaving room for meters on a 3 1/2-inch panel.

for the tuned circuits should be done with a nail or other hard rod simulating the plate pin.

The Transtech 432T is mounted back from a 3 1/2-inch panel, in a way that allows meters and other components to be completely outside the chassis proper. This simplifies shielding problems, and in units where all parts and tubes are mounted inside the chassis, or on the back, it is a real space saver.

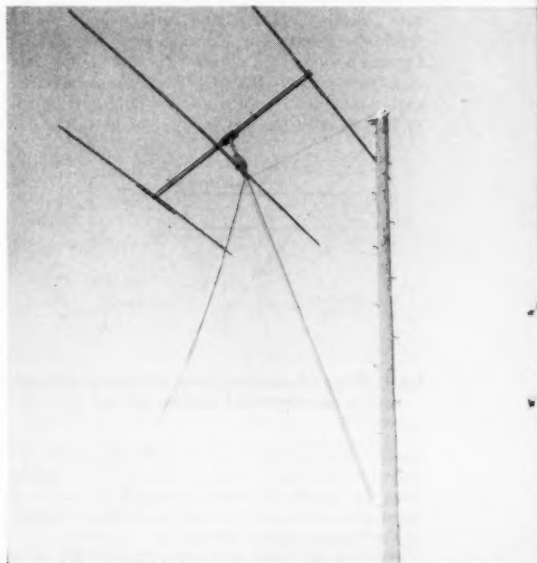
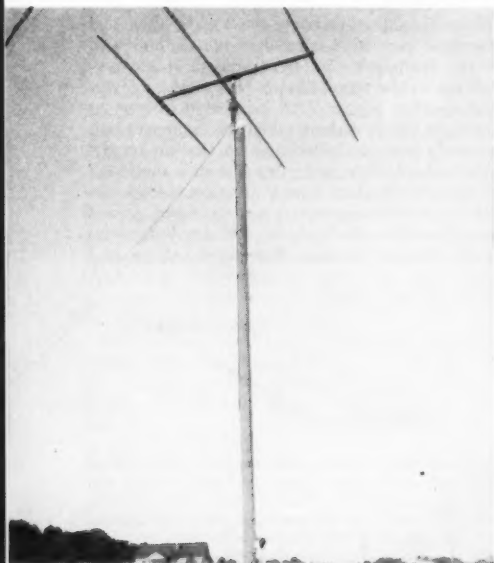
The meter has a 25-ma. scale. Switch positions provide for reading the tripler grid and plate currents, the final plate voltage and grid and plate currents, and output. The last item is relative, of course, the indicator system being of the r.f. voltmeter type, with no attempt at calibration.

The model inspected here violates the standard safety code for power supplies, in that a female socket is used on the chassis for power connection. This requires that the power cable be terminated in a male plug, leaving hot terminals exposed if it is removed from the transmitter without turning the power off. Power requirements are 6.3 v. a.c. at 4 amp. and 300 to 350 v. d.c. at 270 ma.

— E. P. T.

Strays

Already having a couple of phone poles in his yard, K4RER found it an easy matter to design and construct his own tilt-over antenna support. As can be seen from the photos, by means of a swivel, a winch, a pulley, and some 3/8" steel cable, he rigged up some 2" pipe so that it can be raised and lowered together with the rotator and beam. The winch is of the self-locking type and holds the mast securely in position, particularly because of the vee-shaped bracket at the top of the pole into which the mast snaps when pulled up snug against the pole.





WITS at the key.

THE *Bowdoin's* last voyage — four days from Falmouth, Mass. to the Marine Museum at Mystic — was tougher than a 15-month trip to the North Pole . . . at least for her ham radio operator.

Don Mix, WITS, of Bristol, Conn., sailed on the *Bowdoin* 36 years ago with the famous Arctic explorer Admiral Donald B. MacMillan. The first ham to operate a short-wave set in the Far North, he was the little *Bowdoin's* only link with civilization.

In those days he pounded his WNP call on 220 meters with a cumbersome cage antenna strung between the masts.

This June, he sailed on the *Bowdoin* again, giving hams their last chance to work the ship before she was permanently enshrined in the Marine Museum.

He worked on 20, 40 and 80 meters with a SX-101A receiver and HT-30 transmitter donated by Hallierafter and his own Johnson Viking Valiant. He had a single antenna run neatly up a mast — and entirely too much civilization.

The *Bowdoin*, 88 feet long and weighing 35 tons, was built to carry eight. There were 16 members of former Polar crews aboard this time plus 30 newsmen who alternated between interviewing Don and hauling him off into corners to demand why he wouldn't send out their stories so they could pull a fast one on their competitors.

The *Bowdoin* has sails and an auxiliary engine. She traveled by engine. "There were so many people on deck, you couldn't put a sail up without sweeping half of them off, said Mix."

At every port, sightseers swarmed aboard.

"I'd have a big ring of people all staring at me and a dozen heads peering down through the

Down the Hatch!

hatch as I tried to send. They all wanted to know what I was doing. I wasn't doing much."

Things quieted down about 11 P.M. so Don pounded brass until 3 A.M., catching three hours sleep a night. But radio conditions were bad in the late hours.

The last two days, he couldn't transmit while underway. The gas generator powering Don's rig was on deck. It was quiet, but not silent. The fog was so heavy that crew members needed complete silence to listen for fog horns and to call from bow to wheel.

Then a handsome yacht escorting the *Bowdoin* ran aground on rocks.

"They thought I was pretty dumb when I said I couldn't call the Coast Guard on the ham bands," Mix reported.

But real tragedy struck the last night before reaching Mystic. Don ran out of cigarettes!

The *Bowdoin* was anchored half a mile out, off Fisher's Island. Chain-smoking Don was caught.

"I nearly died of nicotine loss."

Despite the obstacles, WITS QSO'd hams as far away as California. Three of his contacts were with hams he worked from the North Pole on his first *Bowdoin* voyage: R. B. Bourne, W1ANA, of West Hartford, Conn.; Bob Morris, W2CQZ, of Millburn, N. J.; and Bart Molinari, W6AWT, of San Francisco, Calif. He even worked Robert J. Ruplenes, W1DDO, of Boston, Mass., who was running a quarter-watt transistor rig.

All QSO's will receive specially designed QSLs.

The *Bowdoin*, designed by Admiral MacMillan, is known as the sturdiest wooden ship of her size ever built. But she wasn't designed for six-footers.

"The only place I could stand up was under the hatches," said lanky Mix. "But there were only three hatches — and one was above the dinner table." — F.M.

QST



Bringing the *Bowdoin* home is Admiral Donald B. MacMillan. His wife is beside him, WITS behind the two. One of the ever-present photographers is in the background.

August 1959



Hints and Kinks

For the Experimenters



AN OSCILLATOR CIRCUIT FOR A 6-METER CONVERTER

WE (W4SGI, W4LQE, W4KNY) were interested in the transistor receiver described by W2TGP in *QST*, February 1959, page 11. It appeared from the data on the 2N384 r.f. amplifier that this transistor would also work on 50 Mc. After building the local oscillator portion of the "front end," we had difficulty getting it to oscillate so we tried a circuit suggested by W4LQE. The circuit is shown in Fig. 1. One feature of this oscillator is the feedback capacitor C_1 , which may be replaced with a crystal so that the circuit becomes crystal controlled. Of course, the fundamental frequency (or overtone frequency) of the crystal must be the same as that of the tuned circuit. If more than one 2N384 is available, the one with the highest gain is selected for the r.f. amplifier and an inferior one is used for the oscillator.

With this oscillator circuit and W2TGP's r.f. amplifier and mixer circuit, we constructed a 6-meter converter. It was tested in W4SGI's shack and performed well. Naturally, it could not compare with our best tube converters, but it did a remarkably good job.

Some general remarks about the proper handling of transistors may help those who have not had much experience along this line. Due to the capacity of sockets, it would be wise to solder the transistors in place rather than to use transistor sockets. The leads should be left as long as is consistent with wiring needs. During the soldering operation the transistor leads should be held firmly with a pair of long-nosed pliers which will act as a heat sink and keep the heat away from the transistor. The tuned circuits should be grid dipped before installation of the transistor. Nor-

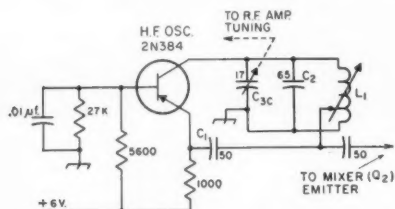


Fig. 1—Circuit of the 6-meter oscillator circuit. The tuned circuit C_2 , C_3C , L_1 is tuned to the oscillator frequency. L_1 is tapped at one turn from the cold end. See *QST*, February 1959, page 11, for circuit information on the r.f. amplifier, mixer, etc.

mally the transistor will add only a few μf . of capacity to the circuit. If "dipping" is done after

the transistor is installed, little or no dip will be observed and there is a chance of damage to the transistor.

— H. E. Banta, W4SGI

FEED-LINE CONTINUITY AND SHORT-CIRCUIT CHECKER

WHEN installing a beam of the split driven-element variety I always connect a 100,000-ohm, $\frac{1}{2}$ -watt resistor across the element at the antenna as shown in Fig. 2. Installation of this inexpensive component enables me to check continuity or shorts in the feed line at any time by measuring the resistance of the feed line with an ohmmeter. Any value over 100,000 ohms means a break somewhere in the feed line or a bad connection at the driven element. Any value

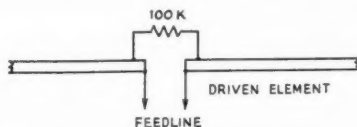


Fig. 2—W9DGV's feed-line checker.

less than 100,000 ohms indicates a short. Insertion of the resistor does not affect the performance of the antenna system.

— John E. Greve, W9DGV

PIN SOLDERING AID

SOLDERING to pins such as those found on plug-in coils, phono plugs and tube bases is sometimes difficult. Often the solder will adhere to the sides of the pin making it oversized and too large for its socket. I use a lighted match to "smoke up" the outside of the pin before soldering. After this treatment the solder will not stick to the pin and the smoke residue can be easily wiped off when the soldering job has been completed.

— Douglas Dawson, KN0RTW

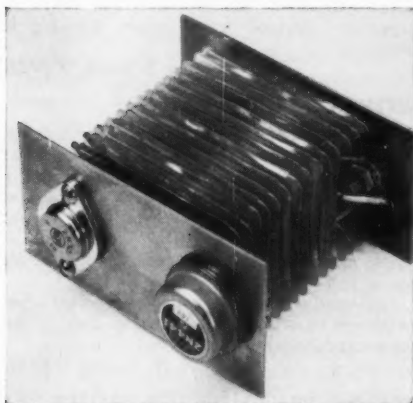
PROTECTION AGAINST SHORTS AND ARCING

BOLTS or machine screws that extend through chassis or partitions sometimes come dangerously close to high-voltage leads and components. To insure against short circuits and arcing, I use a common household electrical wiring splice-connector threaded over the projecting bolt or screw. These splice-connectors are usually made of insulating plastic and have a tapering internal thread. When they are threaded onto the bolt they make a very tight fit.

— Jerry A. Collum, K8IKM

EFFICIENT TRANSISTOR HEAT SINK

THE transistor heat sink shown in the photograph is made up of "Tube and Fin Assem-



bly" stock used in homes for hot-water heating. This material is available from most plumbing-supply distributors and is relatively inexpensive in short lengths. With a little persuasion a scrap piece of sufficient length could probably be promoted without charge.

The stock comes with aluminum fins attached to a $\frac{3}{4}$ -inch copper pipe running through the center axis. Copper plates will have to be soldered to the ends of the pipe to form the two large end plates on which the transistors are mounted. The sink shown in the photograph required a 3-inch section of "fin" stock. The end plates are 2×4 inches and the fins are $2 \times 2\frac{3}{4}$ inches. Though it can be held in the palm of the hand, it has an effective cooling area of about 130 square inches.

— E. Laird Campbell, W1CUT

THUNDERBOLT SCREEN PROTECTION

SINCE some Thunderbolt owners are unaware of the automatic screen protection inherent in the equipment, and because others building their own equipment could utilize the simple circuitry to advantage, a brief description of the Thunderbolt screen circuit appears to be worthwhile.

The old and accepted practice of using a high series screen impedance is used so that the screen dissipation is limited because the screen voltage drops as the screen current increases, thus limiting the screen power input.

For example, the Thunderbolt utilizes a 600-volt screen supply which feeds a VR tube chain through a 2500-ohm resistor to provide regulated 510 volts on the 4-400A screens. In the event of a bias failure — as adverse a situation as can occur — the screen current goes up to 150 ma., the supply voltage drops to 540 volts and the 275-volt *IR* drop in the resistor leaves only 165 volts on the screen, or 12 watts per tube. This is approximately $\frac{1}{3}$ of rated dissipation. Screen cur-

rent is also within ratings.

The series screen impedance should be as high as possible, consistent with supply volts, desired regulator or operating potentials and tube characteristics.

— A. M. Pichitino, W0EDX

MODIFYING THE HEATHKIT MMI FOR MOBILE MEASUREMENTS

THE modification described here will enable an amateur possessing a v.o.m. with a 0-15 volt scale to change the range to read 0-15 volts. Most volt-ohmmeters seem to have ranges either too high or too low for measuring the 12 to 14 volts in an automobile. A 0-15 volt range makes mobile voltage measurements more convenient and accurate. A.c. ranges are included in this modification since some generators, such as those manufactured by Leece Neville, have a.c. outputs.

First, subtract the scale to be changed (in this case 1.5) from the scale desired (15 volts, giving 13.5). Multiply this figure by the sensitivity of the basic movement of the meter. In the case of the Heathkit MMI, the sensitivity figure is 20,000 ohms/volt d.c. and 5000 ohms/volt a.c. Multiplication by these factors gives 270,000 for d.c. and 67,500 for a.c. These figures represent the resistance in ohms to be placed in series with one of the leads. It is desirable that these be 1-percent tolerance resistors.

Two methods can be used to insert the resistors in the proper circuit. The easiest and most economical method is to make two external probes, one for d.c. measurements and one for a.c. One end of the resistor is connected to a banana plug that will fit the 1.5-volt meter jack and the other end is connected to the probing wire or lead. A second method is to connect the resistors to a miniature 4-position rotary switch. This switch is mounted on the instrument in the space between the "ohms-adjusting" potentiometer and the —15-amp jack. The wiring diagram is shown in Fig. 3.

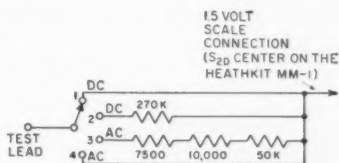


Fig. 3—Diagram of the meter circuit. All resistors are $\frac{1}{2}$ watt.

Positions 1 and 4 switch out the resistors so that the meter reads normal. Position 2 allows measurement of 15 volts d.c. and position 3, 15 volts a.c. The resistor for the d.c. scale is a standard value but the 67,500-ohm a.c. unit is not. A combination of resistors can be connected in series to obtain the proper value.

— Maurice I. Sasson, M.D., W2JAJ

BUZZER OSCILLATOR

THE buzzer oscillator shown in Fig. 4 can be used as a crystal tester, band-edge marker, or as a source of r.f./i.f. signal. The buzzer I_1 emits a damped radio-frequency wave modulated at audio frequency. A crystal Y_1 connected to the buzzer becomes shock excited at its fundamental frequency. If the output lead is connected to the receiver's antenna post, a swishing sound, along with sharply defined sidebands, will be heard. A

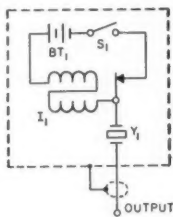


Fig. 4—Circuit of the buzzer oscillator. I_1 is a high-frequency buzzer.

dead or null spot will be found on the exact crystal frequency. The unit here is built in an enclosed box with switch S_1 mounted on the panel. The battery BT_1 is composed of several flashlight cells.

—Lonnie Thomas

REPAIRING SCREEN-TO-CONTROL-GRID SHORTS

IF a tetrode becomes inoperative because of a short between screen-grid and control-grid, don't throw it away! Try repairing it by the following method. Charge a good husky electrolytic capacitor (50 to 100 μ f.) up to 200 or 300 volts. Discharge the capacitor across the tube pins connected to the shorted grids. The high current surge of the discharging capacitor may unlock the short and the tube will be as good as new. I have restored a v.h.f. tetrode four times by this method. It's still going strong, running 85 watts on 220 Mc.

—Clarke Redfield, K2DIG

SUPERHET TRACKING MADE EASIER

THE job of adjusting r.f., mixer and oscillator tuned circuits can become quite complicated in a superheterodyne receiver covering a wide frequency range. This is especially true if the process is attempted after the remaining receiver circuits have been wired. Mounting and unmounting parts, especially around band switches, in a cut-and-try process usually leads to an unsightly finished product.

The tracking job can be done easily if the constructor will first take the ganged tuning capacitor and wire it up breadboard fashion along with the tuned circuits of the r.f., mixer and oscillator. A temporary dial scale and pointer can be used for calibrating each tuned circuit. A grid-dip meter may be used for rough calibration or a modulated signal generator may be loosely coupled to the tuned circuit under test. Place a crystal diode in series with a pair of headphones and

connect across the tuned circuit. When the circuit is tuned to the generator frequency, the tone will "peak up" in the headphones.

With the above method, test runs can be made, circuits adjusted, coils rewound, and trimming capacitors changed until proper tracking is obtained.

—William L. North, W4GEB

ANTENNA R.F. INDICATOR

RELATIVE amount of r.f. energy at the antenna can be indicated by a fluorescent lamp taped to the antenna wire at a voltage loop. For a half-wave antenna, this point is at either end of the antenna. Of course, this scheme is only useful to those who can observe the lamp from the shack, although a system of mirrors could be set up for this purpose.

One word of caution: don't be surprised when neighbors report sighting a strange light—the fluorescent lamp can be observed for miles!

—R. H. Sweeney, W1FEQ

FINDING TUNED CIRCUIT VALUES

TUNED circuits in some equipment must be able to tune over specific frequency ranges. The question arises, what size coil and capacitor combination will be needed? Two simple formulas will answer this question. The first formula is:

$$C = \frac{\Delta C}{f_2^2 - f_1^2}$$

where f_1 is the lowest frequency desired in Mc., f_2 is the highest frequency desired in Mc., ΔC is the range of the variable capacitor in the circuit and C is the total circuit capacitance in μ mf. The second formula is:

$$L = \frac{25,300}{f^2 C}$$

where L is the inductance of the coil in μ h., f is the highest frequency desired in Mc., and C is the capacitance found from the first formula.

The above formulas will indicate how much coil inductance and how much capacitance are necessary in order to tune the desired range with a given variable capacitor. An example of putting the formulas to work: On hand is a 1-to-10- μ mf. variable capacitor that is to be used in a 40-meter bandspread circuit. What value of coil will be needed? Substituting in the first formula:

$$C = \frac{9}{7.3^2 - 1} = \frac{9}{53.3 - 1} = \frac{9}{52.3} = .172 \mu\text{mf.}$$

Now to find the value of L , we substitute in the second formula:

$$L = \frac{25,300}{(7.3^2)(.172)} = \frac{25,300}{53.3(100)} = 4.75 \mu\text{h.}$$

The value of C obtained by this method includes the capacitance that tubes and wiring contribute, so these should be subtracted from the calculated figure in selecting the shunt capacitor.

—Sol Davis, W3WPN

DX-100 — SB-10 MODIFICATION

IN ORDER to use the Heathkit SB-10 Single Side-band Adapter with the Heathkit DX-100 Transmitter, certain modifications of the latter are necessary. These changes are fully explained in the SB-10 manual. The instructions read: "If extended s.s.b. operation is contemplated, it is suggested that the modulator and the speech amplifier tubes (1625, 12BY7 and 12AX7) be removed to reduce the filament current drain." Since 18 screws must be removed from the cabinet before the tubes can be removed, and since I wanted to be able to change from s.s.b. to a.m. with a minimum of effort, I installed a switch to make the change with a mere flick of the finger. In addition, this switch takes the heater voltage off the SB-10 tubes when the DX-100 is operated on a.m. The circuit diagram for the modification is shown in Fig. 5.

Install a double-pole double-throw toggle switch S_1 just above the DX-100's AM-CW-SSB mode switch. (This mode switch was added to the DX-100 as part of the Heath MK-1 modification kit which modifies the SX-100 and SX-100-B for use with the SB-10 adapter). The switch is mounted to fit between the front panel and the filter capacitors which are located behind the panel. Be careful not to damage the filter capacitors when drilling the mounting hole for this switch. Mount a two-lug tie point near the 1625 socket toward the rear of the chassis, and a one-lug tie point near the front 1625 socket, using the existing screws for mounting.

Remove all leads from Pin 1 of the rear 1625 except the one that goes to Pin 1 of the front 1625. Now connect all the wires that were removed in the above step to a lug on the nearby two-terminal tie point (call this Lug 1), except for the lead that goes to Pin 7 of the accessory socket. Connect the lead that goes to Pin 7 of the accessory socket to the other lug of the two-terminal tie point (call this Lug 2). Now dress three wires along the side of the wiring harness and across the front of the chassis. Push them through the hole near the filter capacitors and up to the d.p.d.t. switch S_1 . Number the wires 1, 2, and 3 and connect them as follows: Wire number 1 to lug 1 of the two-terminal tie point and to the switch terminal marked "1" in the diagram. Number 2 wire goes from lug 2 of the tie point to switch terminal 2. Number 3 wire connects pin 1 of the rear 1625 modulator tube to switch terminal 3.

From pin 7 of the rear 1625 tube, disconnect the lead that goes to pin 4 of the 5763 r.f. section tube. Splice a length of wire to this lead and dress it around the front of the 1625 tube socket. Connect the lead to the single lug terminal tie point that was mounted near the socket. Now disconnect the black lead and the black and white striped lead from pin 7 of the front 1625 tube. Reconnect them to the above single lug terminal tie point. It may be necessary to add some length to the black lead though I was able to get enough slack to make the connection.

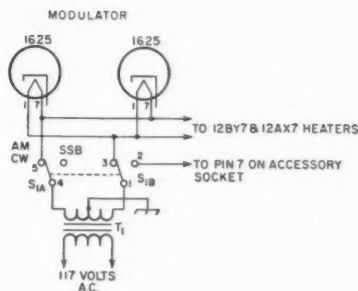


Fig. 5—Diagram showing the heater switching circuit. Transformer T_1 is part of the DX-100's power transformer.

Place two leads along the wiring harness to the switch S_1 . Number the wires 4 and 5 and connect number 4 to the single lug terminal tie point and to switch terminal 4. Connect wire number 5 to pin 7 of the front 1625 tube and to switch terminal 5. Solder all the connections.

One word of caution: When the transmitter is turned on, after this modification has been made, there is B plus on the tubes at all times even when the heaters have been switched out.

— Fred Taylor, K5QBU

ETCHING METAL PANELS

DECAL labels on radio equipment often wear and peel off quickly, particularly on test equipment subjected to constant use. Etched labels, on the other hand, provide permanent identification of control knobs and dials.

To etch a steel panel, pour hot paraffin over the area to be labeled. When cooled, letter the label into the paraffin with a sharp pointed instrument, scraping the metal clean to form the letters or numerals. Neat lettering can be insured by using a lettering guide from a stationary store. Remove any wax shavings with a fine brush and place a drop of hydrochloric or nitric acid on each letter with a medicine dropper. Several applications of acid may be necessary to obtain the desired depth. When etching has been completed, wash the panel with cold water and peel off the remaining wax. The etched characters can be filled with paint or nail polish.

The necessary acids can be obtained in small quantities at most drugstores, but are highly corrosive and should not be brought in contact with the skin. Containers should also be properly labeled and have tight plastic or rubber caps.

— Joe A. Rolf, K5JOK

FRUITCAKE CHASSIS

FRUITCAKE mixes are sometimes sold in small thin-walled steel boxes. These containers make ideal cabinets or chassis for miniature equipment. I am using one for a control box in my mobile station and another to house a capacitor checker. These particular boxes measure $2\frac{3}{4} \times 3\frac{1}{2}$ inches.

— Walter C. Scales, K4RZJ

Geneva—1959

Part I—How We Got Our Present Amateur Bands

BY A. L. BUDLONG,* WIBUD

• For the amateur who desires to keep himself well informed, this series of articles is must reading. Part I, in this issue, sets forth briefly the facts, figures and dates in the history of amateur frequency assignments, a subject of vital interest to ARRL members as we enter upon the period of another world telecommunications conference. Part II, to follow in the next issue, will describe how an international conference does business and outline the preparations taken in the U. S. for the Geneva Conference, which starts August 17th.

TO THE average person, Geneva, Switzerland, is the place where a lot of pre-summit talk has been taking place recently by top diplomats of the major powers. For us amateurs, however, it is the 1959 location of that periodic nightmare known as an international radio conference, a place where the world's "commercials" always triumph and the amateur always loses more frequencies. There is no question about losing frequencies because we now operate in certain narrow bands whereas once—as the fable goes—we had everything from 200 meters down, all for our very own.

These ideas are firmly implanted in many an amateur mind. Were we to say—and we do—that the international treaty under which we now operate affords us far more frequencies than we got at our first international allocations in 1927; that under international treaty we in the U. S. have more now, both below and above 25 Mc. (an arbitrary allocations dividing line) than ever before; that no U. S. law ever assigned amateurs all the territory from 200 meters down; and that neither any U. S. law nor international treaty so much as mentioned the word amateur until 1927 . . . were we to assert these are the facts, it would appear explanations are in order.

And indeed we think they are. Certainly it is true the average amateur has only a hazy idea of what we ever had, of how we got it, why FCC in assigning us frequencies is beholden to an international radio conference, why for that matter we have such affairs, how they do business and how the League goes about representing amateur radio, as it has at every conference beginning with the 1927 affair. (We didn't get into the act at earlier conferences because the one previous to 1927 was held in 1912, before the League was organized.) What we propose to do here, therefore, is to give a brief factual account of

* Secretary and General Manager, ARRL.

amateur frequency assignments, both domestic and international, from the very first days, and to follow with a short description of the hows and whys of an international conference. This is being written in the belief that the information will be valuable to all amateurs and because it is felt it would be more widely read now than at some time when interest in such subjects is not so high.

A History of Amateur Assignments

Why do we have to have international agreements on radio? Broadly speaking, there are three reasons:

1) Since stations of one nation are frequently in communication with stations of another nation, it is necessary to have agreements on such operating details as calling procedure, distress signals, call assignments, methods of collecting tolls on radiograms, etc., unless utter confusion is to be encountered when any two stations try to do business over the air.

2) Because it is possible to operate radio stations throughout a wide range of frequencies, it is necessary to agree in advance where the various services will locate themselves in the spectrum, so that stations will know where to find each other.

3) Since radio signals are not confined to the borders of the country in which they originate, international agreements on allocations to services are also necessary in order to prevent chaotic conditions on the air and hopeless interference between services.

The first two were probably the major considerations in the early radio conferences. The third was not so vital in the early days of radio but today is extremely important.

Pursuant to the international agreements, each nation, both as a matter of common sense and agreement, arranges its own domestic laws so



that they conform to the international commitments. Obviously, it would be silly if the various nations, after carefully working out solutions to their problems, disregarded the remedies by permitting the stations within their borders to operate on some entirely different basis.

Now let us trace the course of all the international conferences and all our own national laws to see how the amateur got taken care of as the laws came along. We'll cover the international treaties first, and then cover our domestic (U. S.) radio laws set up under these international treaty provisions.

International Regulation

The very first international radio conference, though it doesn't really belong in this story, was held in

1903

It was held in Berlin. It didn't say anything about wavelengths, operating procedure or anything of this sort and was held primarily for one reason: there was getting to be considerable trouble because of the fact that stations using Blotto Co.'s equipment would communicate only with other Blotto-equipped stations and would turn studiously deaf ears to calls from stations using Bliffsky or other gear. Such nonsense obviously had to be stopped and this first conference, participated in by nine nations (including the United States, which was to participate in all subsequent conferences) was called mainly for the purpose of putting an end to such shortsightedness.¹ A few clauses regarding charges for messages and priority of distress calls completed the brief document.

The next conference, resulting in the first actual treaty, was the one that really started things off. It was held in

1906

Like the first, it took place in Berlin. Twenty-nine nations participated. Perhaps it would be well to say right now that the principal objective was the setting up of arrangements to deal with ship-to-shore work, that being the main thing radio was then used for. In fact, the only services defined in the treaty regulations were coastal stations and shipboard stations — a station, presumably, was either one or the other!

Judged by present standards, the conference resulted in a pretty simple treaty and an even simpler set of regulations to go along with it. However, it is of interest to us because it was here that we set the *very first* agreements of any kind on wavelength assignments. These agreements were exceedingly simple: coastal stations open to general public service had to be able to use both 500 and 600 meters; ship stations were to use 300 meters for a normal wavelength but could use others if they did not exceed 600 meters;

¹ This conference didn't settle the question, though, and it came up again at both the subsequent 1906 and 1912 affairs, at the latter of which it finally was eliminated as a problem.

small boats unable to "get up" to 300 meters were authorized to use "a shorter wavelength"; and finally — get this! — coastal stations, apart from their two special waves, could use *any* wavelength, so long as it was either below 600 meters or above 1600 meters. Had coastal stations in those days wished to use any of the territory represented by our present amateur bands, they were free to do it.

There was no mention of amateurs in the



treaty and no provision for them except that if any nation had licensed amateurs at that time (none did, including our own United States) it presumably would have to see to it that they stayed below 600 or above 1600 meters.

In addition to these matters, the treaty and regulations specified three-letter calls, limited shipboard power, normally, to a kilowatt, outlined details of hours of service for coastal stations, the posting of "wireless" telegrams, rates, collection of charges, etc., specified the use of the International Morse code for radio work, designated SOS as a distress call and outlined some very rudimentary regs on methods of calling and working.

This second Berlin gathering also decided on the principle of holding similar conferences from time to time and, as a matter of fact, the next was held six years later in London. So we come to

1912

Forty-three nations from all over the world participated in this London conference; our radio gatherings were beginning to amount to something! Not much was done to change the 1906 treaty and regulations but they were enlarged on somewhat. As before, general public-service stations had to be able to use 300 and 600 meters, but now they could also use 1800 meters. Ship stations were 300 and 600 meters. A curious addition to wavelength specifications was one prohibiting stations used exclusively for sending signals designed to determine the position of ships from using a higher wavelength than 150 meters. Here was the first "short-wave" assignment, as such, and it was to radio-bearing stations! However, this was by no means an exclusive assignment, because, just as in the 1906

treaty, any station could use any wavelength (except that the compass stations had to stay under 150) as long as it stayed under 600 or over 1600 meters.

Ship power was still limited, normally, to a kilowatt; additional power could be used if needed, however, for distances over 200 miles or under unusual circumstances. The Q signals came into being. Revisions and additions were made to other operating details but not a great deal of change shows up in this treaty in these matters as compared with the earlier one. Our old friends, the coastal stations and shipboard stations, were still the only defined services.

At this gathering it was agreed to hold the next conference in 1917, but the first World War and its aftermath upset things so badly that it was fifteen years before another radio conference took place.

1927

The 1927 conference was held at Washington. Nearly eighty nations participated; as of that time, this was the largest international gathering ever held on any subject and the first since the advent of "short waves."



The delegates were confronted with a perfectly stupendous task because of the tremendous strides made in radio development since the previous gathering. All the old concepts of radio had been discarded and new theories evolved; new uses for radio had been found with a resulting terrific enlargement in the number of services; telephone had been developed and had given birth to the broadcasting industry; the short waves had found use. As may be imagined, the conference regulations were numerous and detailed, bearing but little resemblance to those in the former documents.

Radio services had segregated themselves into dozens of different distinct classes by this time, so the services mentioned in the list of definitions were considerably more detailed. One of the definitions was that of "private experimental stations." There were two subheads to this definition: the first explained that the definition included stations of the kind we now recognize as "experimental"; the second stated that the definition applied also to "a station used by an 'amateur.'"

We had arrived. Here, for the first time, we find ourselves mentioned in an international radio document.

More than that, the radio spectrum — heretofore virtually wide open to everybody — was now split up into channels, from 10 kilocycles to 23,000 kilocycles, and the various services allotted certain specified channels or groups of channels for their use.² And in this table, we amateurs were allocated the following bands: 1715-2000 kc., 3500-4000 kc., 7000-7300 kc. and 14,000-14,400 kc. Since the regular table of allocations did not go above 23,000 kc. and since we amateurs urged assignments still higher, special assignments were designated at 28-30 Mc. and 56-60 Mc. jointly for the use of the amateur and experimental services.

Licenses were required of all amateur operators and it was further stipulated that each such licensee would have to demonstrate ability not only to transmit the Continental code but to receive it — "by ear." The code speed required of licensees was left to each country to determine for itself, however.

Of course, the regulations also went into great detail on all other matters such as revision of the Q-signal list, calling procedure, rates, methods of collection, license requirements (commercial), etc., but we take it for granted that by now our readers are aware that each set of regulations in the international treaties include these matters and we will not refer to them further. From now on we will treat only those portions of the treaties that deal with amateurs and amateur radio.

Following the Washington Conference, came a five-year interval, and then the second of the really "modern" conferences, in

1932

This was held in Madrid. Very little change was made in the previous treaty or its annexed regulations, except that the general allocations table was extended to 28 Mc., and the "as a guide" aspect was eliminated; thereafter countries agreed to make their assignments in accordance with the allocations table. Our Washington amateur frequency bands were continued intact. However, we had not been satisfied in the Washington regulations with having the definition of an amateur included only as part of a definition of the "private-experimental-station" class; at Madrid, therefore, we sought to have amateurs recognized as a separate and distinct class. The effort was successful and at Madrid, for the first time in an international treaty, we see the amateur service recognized strictly as such.

The next international meeting was in

1938

The location was Cairo, Egypt. By now, the increasing pressure on the high-frequency spec-

² This matter of trying to allocate the whole spectrum by services was a new concept and many nations were a bit cautious about accepting it as binding. In fact, they didn't; the allocations table was specified only "as a guide!"

trum brought about by expansion of existing services and the introduction of new ones was creating serious problems in the allocations table. The spectrum between 3 and 25 Mc., once thought to be of virtually limitless extent, was full to overflowing — with more customers clamoring for admission every day. As might be expected, those countries having little interest in amateur radio regarded our amateur bands as legitimate areas for the spotting in of some of the overflow, and the aggregate initial proposals of the other countries (particularly those in Europe) for a revised allocation table cut heavily into all our bands. Only the unswerving stand of the U. S. delegation in our behalf, supported by our neighbors and sister republics in the Americas, saved all our previous bands for amateurs in this region — we in North and South America emerged without the loss of a kilocycle. Elsewhere, however, amateurs did not fare so well: in the European region, the 3.5-Mc. band was severed, and amateurs permitted only in the portions 3500–3635 kc. and 3685–3950 kc.; outside the American continents, too, amateurs no longer enjoyed exclusive rights to the entire 7-Mc. band, and both amateurs and broadcasting could be permitted to use the territory between 7200–7300 kc.; in Europe, the 5-meter band was reduced, at least in practical effect, to less than half its original width of 4 Mc. Spectrum assignments were extended to 200 Mc. A special appendix indicated a regional assignment table for the American continents and included exclusive amateur bands at 56–60 Mc., 112–118 Mc., and 224–230 Mc. Beyond 230 Mc. no amateur assignments were indicated, although assignments to other services (television, fixed and mobile) were made as high as 300 Mc.

Aside from these allocations matters, there were few other developments of even passing interest to amateurs, and all the other strictly amateur provisions were continued without change.

1947

The year of the Atlantic City conference, which produced the frequency assignments under which we are now operating. Like the 1927 conference, it had to tackle a host of brand-new allocations problems resulting from an incredible development of new applications of radio, particularly in the fields of radar, radio-navigation and a virtually entire new service — international aviation. Since, presumably, readers are familiar with our current operating assignments they will not be listed here. Changes from previous international amateur frequency privileges can be briefly summarized, however: we lost the "160-meter" band to radio-navigation, although retaining sharing privileges to an extent; we lost 50 kc. from the top of the 14 Mc. band; we lost 300 kc. from the top of the 28 Mc. band; we picked up a whole new band of 450 kc. at 21 Mc., went through some readjustment of our previous v.h.f. bands, and picked up all the bands we now have above 225 Mc. So far as the United States

is concerned we retained the 3500-kc and 7000-kc bands intact, but further curtailment of amateur use of these bands in other parts of the world occurred; this applies particularly to the 7-Mc. band, where in Europe and Africa the only exclusive amateur assignment is 7000–7100 kc.

Again, it was only because of the solid support of the United States delegation, with assists from Canada and our sister American republics, that we came out with what we have here — actually a net increase in amateur frequencies both above and below 25 Mc., *the most we have enjoyed under international treaty.*

[To complete the Atlantic City story, it should be noted that the new or expanded service assignments below 25 Mc. came at the expense of the fixed service, primarily, (our 21 Mc. band is an example) which lost roughly 25% of its frequencies previously held in the 2–25 Mc. region. The gainers were chiefly the aeronautical and broadcast services. General assignments were carried up to 10,500 Mc.]

National Regulation

We have now shown, very briefly, what has happened from the early days up to the present time in terms of international regulation. During all this time, however, we were confronted with changing laws and regulations on amateur radio here in the United States under the terms of the United States laws, so let us go back now, see what those laws were and what kind of domestic treatment we got under them.

The outstanding thing about early radio law in this country is that it was an awfully long time before we got the first one!

There was no United States radio law in 1903 at the time of the first Berlin international conference already mentioned, nor was there one in 1906, at the time of the second Berlin affair. It might be thought that this country was obligated to have some sort of national law or regulations after the 1906 conference, in order to carry out the agreements made there to which the U. S. had been a party. The reason there wasn't is that, although we had *signed* the treaty, we didn't *ratify* it until six years later; there had been quite a lot of squabbling and disagreement about that treaty, anyway.

So we see the years dragging on through 1906, '07, '08, '09 — and still no U. S. law on radio. This doesn't mean that no law was needed; indeed, by the latter part of this period "wireless" was assuming considerable proportions in the daily life of the world. But with no laws here amateurs could operate with whatever call, wavelength and power they wished, subject to no regulations whatsoever — and that is precisely what they all did!

In 1910 a very brief law was passed requiring ships of a certain size to carry radio equipment, but it said nothing more than that and has no real bearing in the present discussion. The Act was subsequently modified slightly by another similar act in 1912 but that, also, is of no concern to us.

Nevertheless, the year 1912 is highly significant from our standpoint, for in that year three things happened: first, our Senate finally ratified the 1906 Berlin agreement; second, we participated in the 1912 London Radio Conference and signed the resulting treaty (it was promptly ratified early in 1913); third, the United States wrote its very first radio legislation. This was the so-called 1912 Law, under which we were to operate for the next fifteen years.

Now, we want to direct particular attention to this law because this is the one of which it has been said that it granted amateurs all the territory from 200 meters down, for their own exclusive use. Did it? Let us examine that law and see.

To begin with general considerations, it may be said that the law required that henceforth all transmitting stations in the United States must be licensed. Authority to issue licenses was delegated to the Secretary of Commerce and Labor. There were sections calling for the use of a pure and sharp wave, etc., one requiring listeners to observe the secrecy of messages, provision for punishment of violation of the regulations or the transmission of false distress calls. No individual services were defined except our old familiar stand-bys from international treaties, the coastal stations and ship stations.

This is all fine, but what about wavelength assignments, and particularly that part of the law giving amateurs 200 meters and down? All right, here goes for the wavelength assignments: the 300-meter wavelength was specified for general public-service work, per the international agreements of 1906 and 1912. Furthermore, with one exception, all stations were authorized to use any wavelength they chose, provided they stayed below 600 or above 1600 meters — this again being simply a duplication of the international specification of the time. Now, some readers have by this time noticed that phrase "with one exception." Yes, that exception is the one that is supposed to have given hams everything from 200 meters down. We will quote that article, in full. Here it is:

General Restrictions on Private Stations.

Fifteenth. No private or commercial station not engaged in the transaction of *bona fide* commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding two hundred meters, or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labor contained in the license of the station: *Provided:* That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third³ and fourth⁴ regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section, unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter

in conformity with said regulations.

[Following this was regulation No. 16, stating that any station of the above class within 5 nautical miles of a naval or military station had to keep under 200 meters and under one-half kilowatt in power.]

It may be added, that's all that was said on the subject, in the 1912 law.

Now, did this grant amateurs the exclusive use of the territory below two hundred meters? Alas, it did not! To begin with, this was not a grant of privilege to certain classes of stations; it was, instead, a restriction. Unless certain stations were engaged in transacting business, or developing apparatus in that connection, they couldn't go above 200 meters.

Were amateurs the only ones so restricted? Not at all; as a matter of fact, amateurs are not even mentioned. Read the start of the quoted section; it will be seen that the restriction applies equally to private and commercial stations. If this section can be interpreted as granting amateurs "200 meters and down," it also grants certain classes of commercial stations precisely the same privilege. However, it is important to note that this time that "private station" and "amateur station" are not the same. As we have already pointed out, the section doesn't mention amateurs as such. To be sure, amateurs at that time were classified as "private stations" — but so were a number of other classes! School and training stations were "private stations." So were many of what we now think of as "experimental" stations. Stations set up by a firm to enable it to conduct its own business between its various branches were private stations. About this time, it becomes apparent that between the broad interpretation of "private station" and the inclusion of that "or commercial" the Fifteenth regulation was meant to apply to virtually every station, unless it was conducting commercial business (or developing apparatus in that connection). Correct! It was!

Nor is that all; we point again to the fact that the section says only that the specified types of station cannot go above 200 meters (or over 1 kw.) without special authority. Well, how about the regular commercial stations that were allowed to operate above 200 meters; could they also go below 200 if they wished? The answer is that they could. The authority is contained in the second regulation, which we quote:

Second. In addition to the normal sending wavelengths, all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: *Provided* that they do not exceed 600 meters or that they do exceed 1600 meters . . . [there then follows some dope on use of pure and sharp wave].

The only "except as provided hereinafter" contained in the law was the Fifteenth section already quoted.

Let this, then, be said: the 1912 law, to the extent that it gave amateurs the territory from 200 meters down, assigned precisely the same privileges, by law, to every other class of station in the country.

Except for a period during World War I, when

³ The third regulation required the use of a "pure wave."

⁴ The fourth regulation required the use of a "sharp wave."

all radio stations were closed down, this is the law which we operated under for fifteen years. Incidentally, since another part of this law stated that stations should specify their operating wavelengths in their applications, practically all amateurs gave "200 meters" as their operating wavelength, and then tried to edge up higher than that if they could get away with it! As a matter of interest, no amateur license issued in the United States ever stated that the licensee was entitled to use all the territory from 200 meters down.

Although not affecting any very large group of amateurs, special arrangements were effected during this time between the ARRL and the Department of Commerce whereby certain "above-200" wavelengths were made available to outstanding amateur relay stations.

We have said that the 1912 law was the only one we had until the Communications Act of 1927 was passed. Now, it is apparent that nothing in the 1912 law creates special bands for the various services (we have quoted all the 1912 law which applied to wavelength grants or limitations), yet it is a fact that, three years before the 1927 international conference, amateurs in the U. S. were operating in specific bands of frequencies in the short-wave spectrum.

How come?

All right — brace yourself, for we suspect this will be news to many — those bands were not assigned under law, they had no legal standing, and we had them solely on the basis of temporary and informal agreement with the other radio services of the United States.

Here's the story:

Following the 1912 law, nothing much happened to disturb the tranquility of two-hundred-meter operation until around 1923, when a small group of amateurs (and commercials, too, if we are to be truthful) began going to the wavelengths well below two hundred, to see if they were feasible for communicating purposes. As we now know, they most certainly were, but it took a transatlantic QSO⁵ to make the average ham believe it, at that time. An interesting sidelight here is that since all amateur stations at that time were required to specify their operating wavelengths, and since these were invariably of the order of 150, 175 or 200 meters, it was necessary for the first short-wavers to get special permission to operate on such wavelengths as 100, 90 and 60 meters — these not having been specified in the licenses!

At any rate, when the short waves began to demonstrate their worth around 1924, everybody in creation made a headlong rush for them. Remember: under the ancient 1912 law, still in effect at that time, every single service in the United States had equal rights with everyone else for the use of the short waves!

Now, keep a firm grip on everything up to this point while we backtrack a couple of years to 1922 to pick up some dope that is going to constitute part of our 1924 picture.

Around 1922 it was apparent to the then Sec-

retary of Commerce (Hoover), who was charged under the 1912 law with the duty of administering radio, that the law was hopelessly inadequate for existing conditions. A new law was badly needed, but Congress, with the same slowness which characterized its belated enactment of the original law, simply couldn't seem to get around to making one. So Secretary Hoover called the first of what came to be known as the "Hoover Conferences" at Washington, participated in by representatives of all the radio interests in the country, to see if some mutual agreements couldn't be worked out and some recommendations for the legislators evolved. The League was in on them from the start.

The first of these advisory conferences, in 1922, didn't do very much as far as we are concerned, except that it recommended enactment of proper legislation to deal with radio, suggested certain amateur frequencies (of no interest to us, at the moment, since they were around 200 meters), suggested a definition for amateurs (the 1912 law had no such definition), and recommended that amateur status be defined by law and amateur wavelength assignments ditto. Another recommendation was for the creation of amateur deputy inspectors, possibly at a dollar a year, to help out in amateur regulation! Unfortunately, although a number of radio bills were subsequently introduced in Congress, nothing was actually done in the way of legislation to carry out any of these recommendations. Perhaps it was for this reason that the recommendations of the succeeding Hoover conferences actually became regulations by reason of their adoption as such by the Department of Commerce — not with authority of law, however, but purely on the basis of mutual agreement among services. This curious regulatory status lasted until the "blowup" of 1926, of which we shall speak shortly.

The second conference took place in 1923; the short waves had not yet opened up, and the conference recommendations for amateurs were all in the vicinity of 150-200 meters. Amateur radio would have kicked like the dickens if they had been anything else.

The third conference was in 1924; between it and the second the short-wave business had split radio wide open! The 1924 conference was tremendously important, therefore.⁶ However, bear in mind that nothing any of these Hoover conferences did had any actual legal status. The recommendations were nothing more than recommendations; such agreements as were reached were on the basis of mutual understandings between services, temporarily (and illegally) incorporated into the regulations by mutual consent and thereafter observed by all until a new law came along. Actually, by this time everyone in radio realized that the wording of the 1912 law was such that

(Continued on page 150)

⁵ Since the short waves "broke" several months before the conference, the ARRL had negotiated several special low-wave bands for amateurs, pending the decisions of the conference. The resulting conference agreements were considerable expansions over the space made available by these temporary assignments.

• *Beginner and Novice* —

HPE CUAGN ON C.W., OB!

BY KEITH S. WILLIAMS,* W6DTY

A FREQUENTLY heard complaint is that c.w. contacts are tedious and boring. I am inclined to agree, even though I am an old die-hard devotee of the brass pump handle. But the code itself is not the villain.

Low code speed can be a major road block to the enjoyment of c.w. operating, but is by no means the only reason for tedious QSOs. Unless you can handle code at a speed above 25 or 30 words per minute, the use of operating short cuts is imperative if you are to say what you want to say in a reasonable amount of time. The average speed of beginner ham c.w. operators is considerably lower today than it was a good many years ago, with speeds of ten words per minute or less being very common. At such low speeds it can take forever to say something if you insist on spelling every word out to the last letter and on throwing in all the words and all the punctuation that you would employ in writing a theme for English class. Failure to use abbreviations and other operating short cuts can make an irritating session of what could have been a very pleasant QSO.

If you are just beginning in ham radio and your code copying ability has improved enough so you can tune around the amateur c.w. bands for a bit of copying practice, you probably have been puzzled sometimes by the fact that, while you're sure you copied correctly, the copy doesn't make sense! For example, what do you make of "VY TNX QSO OB" or "HR WX OCAST ES CLD TODA" or "MI FD NG FER DX BUT MI VERT FB"? These are verbatim transmissions copied at W6DTY during recent contacts on 40 meters. This stuff may be gobbledygook to you; but if you copied it, you *did* copy correctly and the senders *were* actually saying something. In the first case the man said, "Many thanks for the contact, old boy." The second collection of gunk states, "The weather here today is overcast and cold." The third gem was sent by a man talking about his antenna problems. He said, "My folded dipole is no good for working DX, but my vertical antenna gets out fine." These examples of ham c.w. lingo are somewhat extreme and are not necessarily typical, but they serve to illustrate the time-saving capability of abbreviations. The translations are not literal, of course, but do represent the thoughts transferred by radio-telegraph from the sending operator to the receiving operator.

There is a great deal more to on-the-air c.w. radio operating than a mere knowledge of the International Morse Code. A major contributing

factor to slow, tiresome contacts is the inability of a great many amateur operators to comprehend or use "Q" signals, abbreviations, and other operating short cuts.

If you wish to take the tedium out of your c.w. QSOs there are three operating short cuts you may employ: (1) Use "Q" signals wherever they apply; (2) Leave out all words which are not necessary to the sense of what you are saying; (3) Use the standard abbreviations for words most commonly transmitted during a QSO.

Q Signals

The international list of "Q" signals covers a lot of ground. The "Q" signals allow you to make a detailed statement with only three transmitted letters, or to ask a lengthy question with only four characters. For instance, rather than having to spell out the statement, "I am being interfered with," you merely send the letters "QRM." Instead of spelling out the question, "Shall I send faster?" you use the signal "QRQ?" The time-saving value of the "Q" signals should be obvious.

For the "Q" signals to be meaningful, they must be properly used. It is well worth while to memorize the statements and the questions connected with each of the "Q" signals ordinarily used in ham radio operating. The list can be found in any edition of *The Radio Amateur's Handbook*. In regard to the use of "Q" signals, don't overlook the question mark; it's important! Without the question mark the signal is a statement of fact or a direction as to procedure; when the question mark is added to the signal, the signal becomes a question, asking for information or for instructions as to procedure. A very common error on the amateur bands today is the use of the signal "QRZ" without the question mark. For example, suppose WA6XYX calls CQ and is answered by another station but, perhaps because of interference, doesn't get the call letters of the answering station. In order to indicate that he heard the calling station but did not copy the call letters, WA6XYX should make a brief transmission as follows: "QRZ? QRZ? DE WA6XYX K." The signal "QRZ?", with question mark, means, "Who is calling me?" It is commonplace to hear amateur operators employ this "Q" signal, for the purpose just described, without the question mark. This is patently nonsensical because just plain QRZ means, "You are being called by"

Cutting Down on Words

In most sentences certain words can be left

* 355 East Laurel St., Oxnard, California.

out completely without altering the meaning of the sentence. On phone this would make you sound like an idiot, but in code it sounds perfectly natural and shortens transmission time by an appreciable amount. The other day, during a c.w. contact, I copied, "I NOTICE THAT THE BAND IS VERY FUNNY TODAY." At ten words per minute this statement took some time to send. It could have been sent, "NOTICE BAND VERY FUNNY TODAY." The words I, THAT, THE, and IS could have been eliminated without detriment to the information being transmitted. Incidentally, one of the purposes of the "Q" signals, aside from the fact that they are internationally understood regardless of the language spoken by the operator, is to shorten transmission time by using only three letters to make a statement. The commonly heard ham expression, "MY QTH IS . . ." defeats the purpose of the "Q" signal. The signal QTH means, "My location is. . . ." The words MY and IS are already included in the "Q" signal. So, instead of eating up time by saying, "MY QTH IS PODUNK CALIF," you need only send, "QTH PODUNK CALIF."

Standard Abbreviations

Because there are a number of words and expressions which are very common in amateur c.w. operating, such words have been abbreviated to shorten transmission time. These abbreviations have come into use over a long period of years and, in most cases, are quite standard among operators the world over. Perhaps the best description of the art of abbreviating appeared in older editions of *The Radio Amateur's Handbook*. Let me quote the 1933 edition of the *Handbook*:

"In amateur work many of the most commonly used radio and ordinary English words are frequently abbreviated, either by certain generally

recognized methods or, as often occurs, on the spur of the moment according to the ideas of the individual operator. Beginning amateurs are likely to be confused by these ham abbreviations at first, but will probably pick them up quickly enough in the case of the more or less standard ones, and get the general idea governing the construction of the unusual ones occasionally encountered.

"A method much used in short words is to give the first and last letters only, eliminating all the intermediate letters. Examples: Now, NW; Check, CK; Would, WD.

"Another method often used in short words employs phonetic spelling. Examples: Some, SUM; Says, SEZ; Good, GUD; Night, NITE.

"A third method uses consonants only, eliminating all vowels. Examples: Letter, LTR; received, RCD; Message, MSG.

"Replacing parts of a word with the letter "X" is a system occasionally used in abbreviating certain words. Examples: Transmitter, XMTR, or TX; Weather, WX; Distance, DX; Press, PX.

" . . . we want to caution the beginner against making too great an effort to abbreviate or to scatter abbreviations wholesale throughout his radio conversation. A judicious use of certain of the short-cut words is permissible and saves time . . . the only legitimate object of abbreviations, of course. To abbreviate everything one sends, and to do so, in many cases to extremes, is merely ridiculous."

The list which follows includes most of the "standard" abbreviations heard on the amateur c.w. bands today. Except in a few instances, procedure signals are not listed. It is hoped that this glossary of ham brass-pounding terminology will be of some considerable help to beginners and to many of the newly licensed novice or general class operators.

AA	All after
AB	All Before
ABT	About
ADR	Address
AGN	Again
AMP	Ampere; amplifier
AMT	Amount
ANI	Any
ANT	Antenna
BCI	Broadcast interference
BCL	Broadcast listener
BCNU	Be seeing you
BD	Bad
BIZ	Business
BK	Break; break me; break in
BKG	Breaking
BKIN	Break-in
BN	Been; all between
BUG	Automatic key (formerly only a Vibroplex; now generally applied to any automatic key)
BUK	Book
B4	Before
C	Yes; that is correct
CANS	Headphones

CC	Crystal controlled
CFM	Confirm; I agree
CK	Check
CKT	Circuit
CL	I am closing my station; call
CLD	Called
CLG	Calling
CRD	Card
CU	See you
CUAGN	See you again
CUD	Could
CUL	See you later
CW	Continuous wave (commonly applied to telegraphic communications or equipment)
DA	Day
DLD	Delivered
DPE	Dope; data; information
DWN	Down
DX	Distance
ECO	Electron-coupled oscillator
ES	And (&)
FB	Fine business; excellent; very good
FD	Folded dipole
FER	For

FIST	Sending characteristics, using telegraph key (as in "gud fist," "bum fist," etc.)	RCVR	Receiver
FM	From	RI	Radio inspector (F.C.C. official)
FONE	Phone; telephone	RIG	Radio transmitter (transmitter only; does not include receiver and/or antenna)
FREQ	Frequency	RITE	Right
GA	Go ahead; begin (or resume) sending	RPT	Repeat; report
GB	Good bye	RST	Readability, signal strength, and tone
GE	Good evening; good afternoon (use after 12 o'clock noon)	RX	Receiver
GG	Going	SA	Say
GM	Good morning	SED	Said
GN	Good night	SEZ	Says
GND	Ground	SIG	Signature (as on a message); signal
GUD	Good	SIGS	Signals
HI	Indicates laughter; high	SINE	Sign; personal identification, such as initials or nickname
HPE	Hope	SKED	Schedule
HR	Here	SRI	Sorry
HRD	Heard	SSB	Single sideband
HVE	Have	STICK	Pencil
HVG	Having	STN	Station
HW	How	SUM	Some
HW?	What do you say?	SWL	Short wave listener
INFO	Information	TFC	Traffic (relates to messages, or message handling)
KW	Kilowatt	TKS	Thanks
LID	Poor operator	TMW	Tomorrow
LTR	Letter; later	TNG	Thing
LW	Long wire (antenna)	TNX	Thanks
MANI	Many	TODA	Today
MI	My	TRUBLE	Trouble
MIKE	Microphone	TT	That
MILL	Typewriter	TU	Thank you
MILS	Milliamperes	TV	Television
MLS	Miles	TVI	Television interference
MOD	Modulator; modulation	TX	Transmitter
MTRS	Meters	U	You
N	No; that is incorrect	UR	Your
ND	Nothing doing	URS	Yours
NG	No good	VERT	Vertical (antenna)
NIL	Nothing; I have no traffic; no more here	VFO	Variable frequency oscillator
NITE	Night	VY	Very
NM	Nothing more; no more	WA	Word after
NR	Number, near	WAT	What
NW	Now; I will continue	WATSA?	What do you say
OB	Old boy; official bulletin	WB	Word before
OC	Old chap	WD	Word; would
OM	Old man	WDS	Words
ONLI	Only	WID	With
OPG	Operating	WK	Work
OPR	Operator	WKD	Worked
OSC	Oscillator	WKG	Working
OT	Old timer (formerly meant "oscillation transformer" and "old top")	WL	Will; well
OTC	Old timers' club	WUD	Would
PLS	Please	WX	Weather
PSE	Please (preferred)	XFMR	Transformer
PWR	Power	XMTR	Transmitter
PX	Press (news sent by radiotelegraph)	XTAL	Crystal
QRRR	Attention, emergency; distress (amateur radio "SOS")	XYL	Wife (ex-young lady)
QST	Attention all radio amateurs	YF	Wife
R	Receipt acknowledged; received all O.K.; are	YL	Young lady
RCD	Received (preferred)	YR	Year
RCVD	Received	YRS	Years
		73	Best regards (already plural; never say 73s)
		88	Love and kisses

QST

Hamfest Calendar

California — The Santa Barbara ARC is sponsoring its 12th annual hamfest on Sunday, August 23, at Tuckers Grove in Santa Barbara. Bring your own lunch. Refreshments are available at the concession stands, and the club will serve free coffee. Two- and ten-meter transmitter hunts, games for the kids, and programs for ladies and men. For further information contact John W. Deeds, K6KVW, P. O. Box 273, Santa Barbara.

Indiana — The Tri-State Amateur Radio Society will hold its annual hamfest-picnic on August 30 at Eagles' Picnic Grounds, Evansville. There will be games, contests, and prizes. Refreshments available on the grounds. Mobiles can check in on 75, 10 or 6 meters. Advance registration is \$2.00, or \$2.50 at the gate. For further information write to the hamfest chairman, Dr. Thomas G. Westfall, W9BKQ, 2409 W. Franklin St., Evansville.

Iowa — The Iowa 75-Meter Phone Net picnic will be held at Inez Grove Park, Ames, on Sunday, August 16. Potluck dinner at 1300. Coffee will be furnished by the sponsors, the Ames Radio Association. No fee, but bring your share of the potluck. Mobiles monitor 3970 kc. Further information available from Dennis Burke, W9NTB, 1418 Douglas Ave., Ames.

Iowa — The second annual Cedar Valley hamfest, sponsored by the Cedar Valley ARC and the Linn ARC, will be held on Sunday, August 30, rain or shine, at the Hawkeye Downs Fairgrounds on Highways 30 and 218 south of Cedar Rapids. Plenty of contests for both men and women, with the program starting at 1000. Meals can be purchased at the site. Pre-registration \$1.50 men, \$1.00 women; at the gate \$1.75 men, \$1.00 women. For information and tickets write Jay Spalti, W8SCM, 3239 Vine St., S.E., Cedar Rapids.

North Carolina — The annual hamfest of the Shelby Radio Club will be held on Sunday, Sept. 6, at Brackett's Cedar Park, 14 miles north of Shelby on highway #10. Southern fried chicken, fish, hush puppies with all the fixings, all you can eat. Entertainment and contests. Mobile talk-in on 3895 kc. For map and information contact Malcolm E. Spangler, K4KUT, Box 481, Shelby.

Ohio — The Green Valley Radio Club will hold its second annual "Dr. Lee De Forest Day" celebration, hamfest and dealer display on August 16 at the National Guard Armory, 1175½ West Vine St., Alliance. Games, contests, prizes. Advance registration is \$1.00, or \$1.25 at the gate. For reservations contact Harry E. Pownell, W8PXX, RFD #2, Alliance.

Ohio — The Warren Amateur Radio Association will hold its second annual picnic and hamfest at the enclosed shelter house, Packard Park, on Sunday, August 23. Bring your own lunch for a picnic at noon. There will be a swap and shop, ham auction, and entertainment. Registration is \$1.50. Activities begin at 1100. Mobiles will be monitored on 29.6 Mc. Plenty of activities for the whole family, and everyone welcome. For further information contact Don Lovett, K8BXT, 3629 Northwood Drive, Warren.

Pennsylvania — The Mount Airy V.H.F. Radio Club will hold its annual hamfest and family day on Sunday, August 9. (The rain date is Aug. 16). This will be held at the Fort Washington State Park, just off U. S. 309, near Flourtown. Games, free soda. Registration \$1.00 per family. Mobiles monitored on 144.2 or 50.2 Mc.

Pennsylvania — The Pennsylvania Fone Net and the Eastern Pennsylvania CW Net will hold their annual hamfest on Sunday, August 23, at Hershey Park. This is a family affair. Bring your own picnic lunch, or purchase your eats at the park. Registration begins at 0800, and is \$1.00 per call. There will be a meeting of 3RN. For information and registrations contact Edgar Naratil, W3BNR, 423 Lafayette Ave., Palmerton.

Pennsylvania — The fourth annual hamfest of the four York County amateur radio clubs (the Pen-Mar RC of Hanover, the Hilltop Transmitting Society of Red Lion, the York ARC of York, and the Keystone VHF club of York) will be held on August 23 at Altland's Ranch, 10 miles west of York, rain or shine. Registration (\$1.00 in advance or

\$1.25 at the gate, per ham) begins at 1030. Plenty of free parking adjacent to the picnic grounds. Picnic tables available. Free soda and games for all. Auction. Talk-in rigs on 145.62 Mc., 50.62 Mc., 29.5 Mc., and 75 meters. Swimming available at a slight extra charge. For tickets write to John A. Zett, W3FLD, 2740 Grandview Ave., York.

Texas — The annual convention of the South Texas Emergency Net will be held at Kerrville August 28 through 30. For details contact Eugene A. Jank, W5EJT, 100 N. Winston Lane, San Antonio 13.

Vermont — The annual get-together of VE2 and U.S. hams will be sponsored by the Burlington ARC on Sunday, August 9. This 8th annual international field day and Vermont hamfest will be held at Clarey's Bayside, Malletts Bay, Colchester (7 miles north of Burlington). There will be a family picnic, bathing, roller skating, swap session, Vermont CW and Fone net meetings, Green Mt. net meeting, and AREC meeting. There will be mobile treasure hunts on 2, 6, 10 and 75 meters. And a softball game. WIKOO 1 will be on to talk mobiles in. There will be a rendezvous Saturday night at the field day site. For cabin and motel reservations, contact BARC, P. O. Box 30, Winooski. Bring your picnic basket and a registration fee of \$1.00 (children under 16 are free).

Virginia — The annual hamfest of the Shenandoah Valley ARC will be held at the Winchester Armory in Winchester on Sunday, August 2. The program will be indoors, so come rain or shine. A banquet will be held on Saturday night, August 1, and a lunch will be served on Sunday. For further information write to the Shenandoah Valley ARC, P. O. Box 139, Winchester.

Strays

Harvey Board was elected treasurer of the Mira Costa High School Radio Club, whereupon the FCC issued him call WV6FEE.

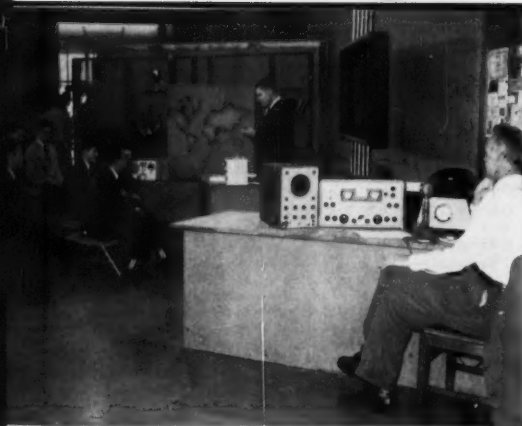
Tired of making WAS the easy way? Try K4DRO's scheme — he worked them in alphabetical order.

This June's graduating class at Hamilton High School in Los Angeles had ten hams and ex-hams in it (K6BEP, K6DBR, K6KUG, K6QGD, K6RCX, W6WRY, WV6CUB, WV6GDU, ex-KN6LRU and ex-KN6QGGJ. — WV6EEO

K1GVD called KZ5AG and discovered that the operator at the other end was W4GVD.

Here's another console arrangement, this one at W2ZXL. The layout and the equipment in use is pretty straightforward, and so there's no need to go into details on that score. Perhaps just seeing some of these neat stations will influence you to clean up some of that haywire in your station!





The opening scene of "The Big Blackboard" show. At the front of the classroom set is K2MBT covering the introductory material just prior to the tour through the shacks set up in the studio. In the foreground W3HQO waits patiently in the typical ham shack for his turn on camera.

BY DICK HARRIS,* K2MBT

AND GEORGE RYAN,** K2DEI

Or— If You Can't Lick 'em, Join 'em!

Amateur Radio Invades Television

Putting on a television show with amateur radio as the theme is a project that requires the time and effort of a great number of hams. The Delaware Valley boys did such an outstanding job, and enjoyed such success, that they would like to tell you about it — just in case you'd like to put on a TV show over your local station.

On Saturday afternoon, April 18, 1959, a little past two o'clock, television viewers in the Philadelphia area were the victims of TVI. From every set tuned to Philadelphia's Channel 10 came the voice of a ham operator calling CQ. It wasn't long before the viewers realized that this was a different kind of TVI. This was TV-Invasion.

What happened on this big day was the culmination of twelve weeks of planning and preparation by a selected committee representing some 23 amateur radio clubs in the Delaware Valley. This committee, headed by George Ryan, K2DEI, prepared a thirty-minute television program on amateur radio operation. It was geared for greatest appeal to the secondary school level, but was kept informative enough so that the general public could also appreciate the basic concepts of one of the world's greatest hobbies. The Production and Script Committee was a smaller group working within the larger committee, and this consisted of Dick Harris, K2MBT, Al Hamilton, W3GIF, and Florence Collins, W3DBN. These three worked in close coordination with the WCAU-TV producers of the "Big Blackboard" show, George Dessart and Warren Knight.

The Background

How the show came into being is the main story we have to tell. Last summer George, K2DEI and Dick, K2MBT were commissioned

by the Board of Directors of the South Jersey Radio Association to work out some publicity for amateur radio in the Delaware Valley. After a brief consideration of local newspaper coverage, we decided to attempt even broader fields. The opportunity for one avenue we really hadn't hoped for occurred as a result of George's employment at one of the local radio stores. One of the Channel 6 engineers was a regular customer for spare parts at said shop, and during a conversation one day the suggestion was made that we attempt to present ham radio to the public via television . . . the very same medium that causes so many Tennessee Valley Indian scalpaches! Whereupon, George and Dick got together and came up with an idea that resulted in a late night interview on Channel 6, featuring K2MBT with W2OGZ, Charlie Jenkins III, on camera answering questions, and George, K2DEI, manning the gear on the set and attempting to log everyone who called in once they found out what was going on. The result of that venture was so successful that we immediately began thinking of a return engagement.

It was this subject that dominated conversation over a strong cup of coffee later that same morning. W2KFC, Lee Miles, mentioned rather casually that there was a possibility we could get some exposure on Channel 10, the CBS station in Philadelphia. It seems a six-meter friend of his is a prominent member of the WCAU-TV engineering department. This is where our main story begins.

* 1014 Chestnut Ave., Laurel Springs, N. J.

** 456 Elm Ave., Maple Shade, N. J.

Getting the Ball Rolling

Lee contacted Ed Harper, K2TYW, and got a very positive reaction to the suggestion because Ed had seen our show on Channel Six and was impressed. In fact, he had already been thinking in terms of a spot on his station when Lee got hold of him. Consequently, Channel-10 producers George Dessart and Warren Wright were approached with the suggestion of an amateur radio presentation on one of their "Big Blackboard" shows. Apparently Ed is a convincing person, because it wasn't long before word came that if we could come up with a suitable format they would be very pleased to let us present the hobby of amateur radio on the Big Blackboard in the near future.

Immediately, K2DEI and K2TYW got together on how to proceed. First of all, they decided that this venture should be colossal, and secondly that it should be the joint effort of all the radio clubs in the Delaware Valley who were willing to participate. K2DEI took charge of this as yet-unformed committee, and called a mass meeting of club representatives. In all, 37 invitations went out and 23 amateurs responded. This first meeting was held in K2DEI's front parlor, where about thirty of us crowded the windowsills and staircase. George swears that his house settled at least an inch and a half that night! Out of this group, a working "Committee of Nine" was appointed. They were: Jim Collins, W3DBL and his wife Florence, W3DBN; Al Hamilton, W3GIF; Edith Rosner, W3AUU; Ed Kushner, W3HKZ; Dick Harris, K2MBT; Bob Edelman, W3ZIE; Ed Mc Vaughn, W3LEM; and Sam Smith, K3GBA. K2TYW was appointed chief liaison between the committee and WCAU-TV. Also, since both K2TYW and W3HKZ were on the staff at WCAU, they served in the valuable capacity of technical advisors. Our ace in the hole was the fact that W3HKZ was shop steward for the television technicians at Channel 10, and both he and K2TYW were active members of the WCAU Ham Radio Club, consisting of some 45 members. So we had the full support of the engineering department! This helped a great deal.

Planning

Weekly meetings were held in one of the Channel 10 studios. One of the first jobs was to draw up a proposed format for the show. The three-

man committee on Production and Script went to work on the ideas that had been discussed at the first meeting. As soon as the Committee of Nine approved the Production Committee's proposal, a meeting was set up with the station producers. Apparently we overdid ourselves, because it didn't take them very long to decide that we could do the job to their satisfaction, and according to their standards. They then committed themselves and us to Saturday, April 18, 1959. We were finally on our way! From here on in we had nothing but hard work ahead of us, and there could be no let-up until the show was off the air.

With the script and production agreed on, the next thing was to appoint a committee to manage the procurement of equipment and manpower. W3DBL headed this group and became a busy collector of ham gear for the next few weeks. One of the biggest breaks that came our way was an offer from Barker and Williamson Company to lend us the use of a complete B&W kilowatt linear station, with a 75A-4 and operator. The operator that went with the equipment was Harold Carr, W3JFI. K2DEI also offered the use of a new Globe Champ for the show.

The original time scheduled for the show was 8:00 A.M., but seasonal commitments during the month of April made it necessary for the station to change the program to 2:00 P.M., a much better time. However, the day the show went on the air another local TV station was broadcasting a baseball game, so we probably lost a few potential viewers to our favorite All-American sport.

The "Big Blackboard" is a WCAU-TV Public Affairs Presentation. Its purpose is to expose secondary school pupils to the arts and sciences in an interesting manner, to spur them on toward a possible career or college education. It was felt that a presentation of the ham radio hobby in action would interest those who were potential electrical engineers or physicists. With this in mind, we were cautioned to develop our presentation toward young people in the hope that some would take up the hobby and develop interest toward college and a possible career in electronics.

The format of the "Big Blackboard" show calls for one person to act as the lecturer, or professor. In our case we were to have several persons on the set to demonstrate the equipment in action, but in order to tie the whole business into a single compact demonstration the committee de-

K2MBT, during rehearsal, runs through his lines on the DX station set. W3JFI is seated at the controls of the B & W linear sidebender lent for the show by Barry Barker. A studio hand is busy in the background adjusting the props while an interested ham visitor watches things at the right.



August 1959



W3DBL mans the radio control transmitter and W3TUU makes final adjustments on his r.c. plane while the Zoomar lens catches the action from the studio door. In the background the Philmont mobile truck stands by for its turn on camera. Beyond this, an amateur mobile awaits its turn to demonstrate.

cided to draft one of its own members. As a result, K2MBT, because of his experience in broadcasting, was duly appointed narrator on the Big Blackboard on behalf of the Delaware Valley amateurs. Dick had always had a slight frustration to emote before the cameras, and here he would get the chance to do his stuff for a solid thirty minutes, with a very informal format!

One thing that soon became apparent was that there is a world of difference between sitting before a microphone in a quiet radio studio, and working in the glare of television's Klieg lights, with the goggle-eyed TV cameras following you everywhere you turn, not to mention the off-camera mob that goes with every production. But we couldn't have asked for a better gang of fellows to work with. Most of us had never even stepped inside a television studio before, but the crew made us feel right at home. We are all indebted to Bob Matthiessen, W2RUE, crew chief and video operator; the three cameramen, Bill Morris (K3CCX), Dick Kearney, and Bill Wagner; Pat Lynch, W2HVT, our audio man; Ray Wolfe, W3CEQ, our lighting man; and, of course, our two technical consultants, Ed Harper, K2TYW and Ed Kushner, W3HKZ.

Most of the time up to the day of the show was pretty much routine. Perhaps an exception to this was the important job assigned to Edith Rosner, W3AAU. Edie had to handle publicity for the show, and she did a really big job. She contacted the secondary schools of our major viewing area with prepared material to be posted on school bulletin boards. In addition, she saw to it that publicity was released to the newspapers of the area. Some of the local newspapers even developed the basic story about the show to include mention of one of their local hams who was in it. Ham clubs in the area also spread the word on the air during QSOs.

Final Preparations

By Friday night, April 17, all was in readiness except to erect antennas and install equipment in Studio 3. Everyone was sweating out possible interference to station equipment when the rigs were thrown on the air. Consequently all the Channel 10 staff were alerted when try-out time

came. Three transmitters were tried: the six-meter Gonset Communicator, the Globe Champ on 40 meters, and the B&W kilowatt on 20-meter sideband. Everything was clean! We now had operating equipment for a real live demonstration. Everyone was in high spirits. We had feared that the use of live equipment might not work out and we were prepared to fake a few things for the sake of authenticity. This was not necessary.

The B&W kilowatt and the Globe Champ were on the air most of the night. The B&W station set-up was intended to demonstrate the DX phase of hamming, so W3JFI set about to do just that all night. His log showed a very nice variety of countries, including a rare McMurdo Sound station in the Antarctic, and one in Asia Minor. As might be expected, when we finally went on the air Saturday afternoon, all that Harold could raise was a VE3!

By Saturday mid-morning, the studio was a buzz of activity. We had about ten sets in the studio, and all were to be used in the demonstration. Each one of these positions was busily engaged in setting up and tuning up, and around each was an interested group of onlookers. Some of the WCAU personnel stopped in for a quick look around and seemed interested in what was going on. All were quick to admit that never before had they seen such an amount of preparation for the "Big Blackboard."

Action, Camera!

The Big Blackboard starts in a very formal manner with the lecturer in front of the class of students. Ours began well, and from all reports ran very smoothly to the end. Dick, K2BMT, as narrator, opened the show with a greeting and welcomed one and all into "The Wonderful World of Amateur Radio!" From here he took us on a brief tour back through the early history of radio communications. This phase made use of some clever artwork by Dick Shaw, K2KCI. After a very few minutes of introductory material, the viewers were taken on a tour of typical ham stations. First was the typical ham in a ragchew. This set was operated by Ray Cherrill, W3HQO, a television serviceman, talking to Edith Rosner,

(Continued on page 148)

Happenings of the Month

Election Notice Extra Class Status Races Expansion

ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1960-1961 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 21. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

Executive Committee

*The American Radio Relay League
West Hartford 7, Conn.*

We, the undersigned Full Members of the ARRL residing in the Division, hereby nominate of as a candidate for director; and we also nominate of as a candidate for vice-director; from this division for the 1960-1961 term.

(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of an amateur license, and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office

of the League in West Hartford, Conn., by noon EDST of the 21st day of September, 1959. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1 and November 29, except that if on September 21 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Atlantic:* Gilbert L. Crossley, W3YA, and Charles O. Badgett, W3LVE. *Canadian:* Alex Reid, VE2BE, and William R. Savage, VE6EO. *Dakota:* Alfred M. Gowan, W0PHR, and Charles G. Compton, W0BUO. *Delta:* Victor Canfield, W5BSR, and Sanford B. De Hart, W4RRV. *Great Lakes:* John H. Brabb, W8SPF, and Dana E. Cartwright, W8UPB. *Midwest:* Robert W. Denniston, W0NWX, and Sumner H. Foster, W0GQ. *Pacific:* Harry M. Engwicht, W6HC, and Ronald G. Martin, W6ZF. *Southeastern:* James P. Born, W4ZD, and Thomas M. Moss, W4HYW.

Full Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:
July 1, 1959

A. L. BUDLONG
Secretary

EXTRA CLASS STATUS

We publish below a Notice of Inquiry issued by the Federal Communications Commission, discussed in this month's editorial page.

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of

An Inquiry into the Status of the
Extra Class Amateur Radio License
set forth in Part 12 of the
Commission's Rules.

DOCKET No. 12912

NOTICE OF INQUIRY

1. Notice is hereby given of a Notice of Inquiry in the above-entitled matter.

2. On January 28, 1959, the Commission issued a Memorandum Opinion and Order denying a petition submitted by George H. Goldstone, 1926 National Bank Building, Detroit 26, Michigan, which requested amendment of Sections 12.23, 12.46, and 12.131 of Part 12 of the Commission's Rules. The petitioner's purpose was to give some prestige to holders of Extra Class Amateur Radio operator licenses by granting them certain additional privileges.

3. To effectuate this purpose, Mr. Goldstone proposed the following changes:

A. Divide the present Extra Class into two groups: Extra Radiotelegraph licensees and Extra Radiotelephone licensees.

(Continued on page 144)



CONDUCTED BY EDWARD P. TILTON,* W1HDQ

THEY'VE done it again!

We could save some space here if we asked you to turn to page 62 of September, 1957, *QST*, and change a few numbers in the famous story told there. It was one of the outstanding amateur radio stories of modern times, and we tell it again, with 222 substituted wherever 144 appeared in the original as the principal change. Yes, as indicated by our cover, the Pacific Ocean from Southern California to the Hawaiian Islands has been spanned on 220 Mc.! The names, calls, locations, power levels, mode of operation and the propagation medium are the same. Only the band and date are different.

On June 18, after months of preparation, Ralph Thomas, KH6UK, began tests on 222 Mc., with John Chambers, W6NLZ, listening. Making contact nightly on 14 Mc. c.w., as in the 144-Mc. tests of 1957, KH6UK would change over to 222 Mc., keying his 1-kw. rig automatically while W6NLZ listened. This procedure was followed for nine months before the first breakthrough on 144 Mc., but success on 220 came on the fifth night of the tests.

John had seen the inversion layer clearly up against the mountains back of Santa Monica Bay, as he drove up the winding road to his 910-foot elevation atop the Palos Verdes escarpment the night of June 22. This was the tip-off for the 144-Mc. contact, and it worked again on 220. When Tommy changed over to 222 Mc. shortly after 1930 he was heard almost at once. There were to be some agonizing moments before it could be made a two-way QSO, however. Signals came through erratically at first, and conditions were none too good on 14 Mc., so that all told it took some 45 minutes for W6NLZ to get the information through to KH6UK that he was being heard. Even after this was done a two-way on 220 eluded their grasp until 2130 PST.

During this two-hour period the signals on 222 Mc. were in and out, peaking up well, but dropping out completely at times. After 2130 things steadied down, and soon the QSO was going in almost routine fashion. W6NLZ reports that KH6UK reached S9 peaks, and much of the time for the last hour of the QSO the signal was quite steady. Using a converted KWS-1, running 750 watts input, W6NLZ went over to s.s.b. at one time and his signal was copied solid at Kahuku. KH6UK had no means of applying modulation, so there was no voice two-way. The QSO lasted until about 2220 PST.

*V. H. F. Editor, *QST*.

RECORDS

Two-Way Work

50 Mc.: LU3EX — JA6FR
12,000 Miles — March 24, 1956
144 Mc.: W6NLZ — KH6UK
2540 Miles — July 8, 1957
220 Mc.: W6NLZ — KH6UK
2540 Miles — June 22, 1959
420 Mc.: G3HAZ — DL3YBA
500 Miles — June 19, 1957
1215 Mc.: W6DQJ/6 — K6AXN/6
400 Miles — June 14, 1959
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947
*3300 Mc.: W6IFE/6 — W6VIN/6
190 Miles — June 9, 1956
5650 Mc.: W6VIN/6 — K6MBL
34 Miles — October 12, 1957
10,000 Mc.: W6VIN/6 — W6HGK/6
124 Miles — June 23, 1957
21,000 Mc.: W2UKL/2 — W2RDL/2
14 Miles — Oct. 18, 1958
Above 30,000 Mc.: W6NSV/6 — K6YYF/6
500 Feet — July 17, 1957
*Band now 3500-3700 Mc.

Equipment used in this work was put together as a cooperative venture on the part of the principals and several other v.h.f. men. KH6UK ran a kilowatt to a pair of 4CX300As, feeding an array of 4 long Yagis stacked with 2-wavelength spacing in both dimensions. His converter was built by W6BAZ, and ahead of it was a parametric amplifier by W6AJF. This last item is described in our lead article this month. W6NLZ used the much-converted KWS-1 that serves him so well on both 50 and 144 Mc., enabling him to use either s.s.b. voice or c.w. on 222 Mc. His antenna was a pair of 11-element Yagis a mere 20 feet above ground. The converter was by Tapetone — and, incidentally, John won it in Tapetone's contest, results of which were announced in April *QST*. He also has a parametric amplifier, but was not using it at the time. The frequency at both ends was 222 Mc. This is used in preference to the customary low end spot, in order to avoid various forms of QRM prevalent in the Los Angeles area.

As with their success on 144 Mc., KH6UK and W6NLZ have done something unique in the annals of v.h.f. communication. There is no other record of v.h.f. propagation of a tropospheric nature over anything like this distance, and no known use of frequencies even as high as 144 Mc., let alone 222 Mc., over distances of more than 1700 miles. Another notable page has been

added to the proud record of amateur radio in the world above 50 Mc.!

400 Miles on 1296 Mc.

The week end of the June V.H.F. Party was used by W6DQJ and K6AXN for an onslaught on the 1296-Mc. record. W6DQJ/6 was set up on Mt. Abel, 40 miles southwest of Bakersfield, Cal., with the help of W6SDM W6ELT K6DAH and WA6EXD. K6AXN/6 operated from Ball Rock, 15 miles northwest of Corning. Supporting the latter effort were the gang from K6GWE, the V.H.F. Expeditionary Society, of the Bay Area. Several in both parties were veterans of many record-making expeditions, and they knew their jobs well. They had the best possible equipment — crystal-controlled 2C39 transmitters delivering 10 watts output and crystal-controlled converters feeding narrow-band receivers. C.w. emission was used exclusively. Antennas were 4-foot parabolas, with vertically-polarized dipoles.

Liaison equipment was available on 144 and 432 Mc. at both ends. During the evening of June 13, K6GWE/6 and W6SDM/6 worked on both lower bands with 89 signals, but two-way work on 1296 Mc. was not done until 0820 the following morning. Signals on 1296 Mc. were at their best at this time, and they decreased steadily until fading out for good at 0850. Though these two mountain locations are at the extreme northern and southern ends of the great San Joaquin Valley, they are far beyond line-of-sight, so communication over the circuit is possible only during the extreme tropospheric bending of the morning hours. This has been demonstrated in many tries over shorter paths, and W6DQJ says that in all his considerable experience with mountain expeditions on 144 through 1296 Mc. he has never seen a time when signals were not at their best between 0700 and 1000. Reports of 569 and 559 were exchanged between the two stations on 1296 Mc. on this occasion.

Sporadic-E DX on 144 Mc.

Not since June 10, 1951, had there been anything like it. On that date, the 2-meter band opened between Northern Texas and Southern California. Dozens of contacts were made by excited W5s and W6s, and the 1400-mile record that stood until 1957 was set. There have been a few scattered instances of sporadic-E skip on 144 Mc. since, but they have been so short as to provide almost no opportunity for DX contacts.

This year the 50-Mc. sporadic-E season started off with a bang. There were more openings, stronger signals, shorter skip and more double-hop propagation than in any year for some time. Then along came the night of June 17. Observers on 50 Mc. sensed something hot. W4LTU, Springfield, Va., heard a station in Ankeny, Iowa, working another in Southern Illinois, under 250 miles. Knowing that theory indicates that a skip of 235 miles on 50 Mc. means that the m.u.f. should reach 144 or higher, Walt was in there trying. He heard no DX on 2, but he still feels that he should have been able to work into the Denver area. VE3AET, near Toronto, heard double and single hop all through the evening. Reg worked 7 Southern California stations on 50 Mc. between 1858 and 1917 EST, and he observed that there was some extremely short skip in the same area noted by W4LTU.

On 144 Mc., W2ORI, Lockport, N. Y., saw evidence of QRM on all TV channels through 7, and logged some DX on the f.m. band around 100 Mc. At 2100 EST John heard W5YYO, Fritch, Texas, near Amarillo, coming through weakly on 144 Mc. The two made contact at 2145, with 89 signals, and John heard several other DX signals not completely identified. W5YYO worked VE3s AEZ ELA DAA AQG and W2ORI. W5SFW, Amarillo, had only a folded dipole for 144 Mc., and that flat on the roof, but he still heard VE3ELA VE3AQG VE3DIR and W2ORI, all about 1350 miles distant. Phil also spread the news on 50 Mc. as rapidly as possible, and his calls on 6 were responsible for some of the VE3s being on the job on 2. He heard the same short skip near the mid-point of the path as was reported by other observers. Other reports we have to date: VE3DIR worked W5YYO and heard W5MJD. W5MJD, Amarillo, worked VE3ELA VE3AQG and heard VE3DIR and W2ORI.

Not only was this one of the longest and best 144-Mc. sporadic-E skip openings on record, but it also reached into



The fellow who designed this strange structure must have had ham radio in mind. It served the purpose well for W6KMY/5, Bexar, Ark., an expedition to provide 50-Mc. contacts with this hard-to-get state for stations in adjacent states.

the highest latitude yet recorded for 144-Mc. E. in this hemisphere. Probably the farthest north work previously by this mode was when W8WXXV, Mansfield, Ohio, worked W5VY, for what was then the 2-meter record, 1200 miles. Other than this one contact, all 144-Mc. E. DX reported until this year was below the Mason-Dixon Line.

Notice that we qualified these statements with "in this hemisphere." The principal reason for this was that on June 15 there was sporadic-E skip on 144 Mc. in Europe. EI2W, near Dublin, tells us that I1KDB, Naples, Italy, was heard in Northern Ireland and throughout England. I1SUS, Rome, also was heard, though not so widely. Both stations worked into the English Midlands, and I1KDB was heard over distances up to 1500 miles. Also included in this note from EI2W was the information that Harry worked into Copenhagen, Denmark, 800 miles, at 0050 GMT June 14. This was a tropospheric contact, and it is the first on 144 Mc. between Ireland and Denmark.

One more report is on file here that looks like sporadic-E skip. We can't be too sure of this one, for it does not fit the E. pattern as well as the others. At 1745 EST June 11, W1LMZ, Concord, Mass., heard W9HOT, Greenville, Ill. W1UAR, Braintree, Mass., worked W9HOT shortly thereafter. The 50-Mc. band was well open at the time, but this is very short skip, if skip it was, for 144 Mc. Any more information on this or other DX heard or worked around that time on 144 Mc. would be most welcome.

Here and There on 6 and 2

With occupancy of the 50-Mc. band being what it is these days, the tendency is toward higher power and bigger antennas, but low power still works under optimum conditions. K7ALE, Tucson, Ariz., writes of a contact he had with VE7ARF recently, when the latter was running a motorcycle mobile, with 2 watts input and a whip antenna. VE7ARF/VE7 was on 50.02 Mc., of all places, yet the QSO was solid.

When the special 50-Mc. WAS award was set up some



An outstanding 220-Mc. station of the Los Angeles area is K6GTG, Arlington. Bill has worked W7LEE, Parker, Ariz., a 240-mile mountainous path.

year ago provision was made to continue it until at least one had been issued in each U.S. call area. When W8CMS won No. 25 in 1957 that left only the 4th call area without representation on the WAS list. Now that blank spot has been filled. Special 50-Mc. WAS award No. 66 was issued to W4HOB, Bessemer, Ala., this month.

Funny thing about 50-Mc. WAS — the toughest state to work may be an adjacent one, or at least one not far away. This is particularly true in areas where all the states are large, and the next state may be 250 miles or more away. Such distances are not covered often in casual operating on 6. Arkansas is a difficult state for many 6-meter men in the Kansas City area, for example. To help the 6-meter gang with Arkansas contacts, W0KMY set up for business in Bexar, Ark., over Memorial Day week end. There was only a short Florida opening, so all but a few contacts were "locals" inside the 250-mile range. Jack plans two more such expeditions, the week ends of Aug. 1 and Sept. 5. Operation will be on both c.w. and phone on 50.2, 50.899, and possibly 51.99 Mc. W0KMY pleads with the gang not to call on his frequency. This common DX-hog tactic caused a lot of unnecessary QRM during the Memorial Day expedition.

Double-hour sessions of the kind we had in June bring in a lot of states in a short time. K8ACC, Richland, Mich., worked all U. S. call areas in just under 5½ hours June 6. Though we have kept no records on the time required for WACA on 50 Mc., this looks like as good a place as any to start. If you can beat 5½ hours, send us a list of stations and times for your claim.

There seems to be a marked difference in trans-equatorial propagation from one hemisphere to another. Looking over the May PRP reports we find that in the Americas the TE business was about over after the first week or so of the month, for most reporters. Not so on the Asia-Australia and Europe-South Africa circuits, however. ZE2JV, Southern Rhodesia, found evidence of m.u.f. as high as 70 Mc. during May. His 50-Mc. signal was heard by G4LX on May 17, 18, 21, 22, 24, 25, 26 and 27. These observations covered a time spread of 1655 to 1720 GMT. JA3CE heard or worked VKs 16 days in May, including the end of the month. His observations were between 1730 and 2200 Japan time. VK9XK, Papua, missed hearing or working 50-Mc. DX only 4 days, VK4NG also missed 4 days, two of them being different from VK9XK's blanks.

Most of the South American links were blank after the first few days of May, but LU3DCA is of the opinion that more contacts would be possible, and the season longer, if there were more consistent activity on 6 throughout the Caribbean Islands. Michael has 26 countries worked on 50 Mc., one of the best totals we know of.

We have a third-hand report that stations in Ohio worked into Hawaii during one of the sporadic-E openings in June. If this really happened it would be a greater distance than we have heretofore recorded for E_s work on 6. How about some straight dope from the principals?

Here's a lazy man's mobile. W6BJI has a T23-ARC-5 converted for 28, 50 and 144 Mc. With the motor running on 12 volts, and a 96-inch whip working on all three bands, Gib has a quick-change setup for 10, 6 and 2.

Anyone like to work Cuba on 144 Mc? CO2VY recently returned to the band with 500 watts input to a 4X250B amplifier, on 144.986 Mc. He would be glad to keep sched-

ules with interested parties, and he urges stations north of Florida to aim his way and watch his frequency. He and CO2XZ (144.9 Mc.) call CQ nearly every night from 2015 EST on, using c.w. and phone. During April and May, CO2VY worked K4OFG and W4PWC, Key West, W4EFH, Homestead, W4RW1, W4FLH, W4ZXL, K4PMF and WN4ZDV, Miami, and W4GJO, Sarasota.

Mysterious sound on 144 Mc. reported by W8SFG, Hubbard, Ohio: noise tick, about 1 per second, with some misses, heard by stations as widely separated as W8GCS, Warren, Ohio, and W3RUE, Pittsburgh, Pa. It was heard between 2100 and 2300 EST May 19. There was a slight peak in level with beams WSW. Any more on this?

Though much of the country had the worst possible conditions for the June V.h.f. Party, parts of the South and Middle West had wonderful tropospheric propagation. This came close to the end of the Party, and ran over into the following morning, as witness this list of stations worked by W4TLV, Demopolis, Ala., beginning at 2212 CST: W0BTG, W0OHP and W0RYG, Lincoln, W0IAY, Pawnee City, Neb., W0INI, Pleasant Hill, Mo., W0QDH, Salina, W0OZK, Winfield, W0HAJ, Kansas City, Kan., K5CTJ, Duncan, W3PZ, Ponca City, W5HKK, Watonga, and W5-INC, Blackwell, Okla. Barry thinks that the W0BTG and W0QDH contacts may have been the first on 144 Mc. between Alabama and Nebraska and Kansas.

220 and Up

For several years W2AOC, Brooklyn, N. Y., was hampered in the use of his favorite band, 220 Mc., by a peculiar kind of interference. It sounded just like receiver noise, but it was tunable. It blotted out weak signals in the first few hundred kilocycles of the 220-Mc. band, which in the Northeast means all weak signals. The noise came in on the antenna, but no sharp bearing could be obtained for it.

Every visiting ham, including your conductor, was given a chance to solve Marv's problem, but all failed. What kind of noise could be tunable, and yet not respond normally to rotation of the beam? W2AOC tried everything he could think of, including calling FCC, but he got nowhere for a long time. Finally he got FCC action, and after some considerable effort the culprit was located. Cover the next paragraph and make your guess!

When the source of the interference was found, it was so obvious that everyone who had been baffled by the evidence was ready to kick himself for not having solved it on the first try. The noisemaker was a super-regenerative detector — naturally. What else? And it was in a door-opening device. Don't ask us why it had to be peaked on the low end of the 220-Mc. band, but it was. It was so broad on Marv's beam because it was almost below it.

50 Mc. WAS

1 W0ZJB	18 W7ERA	35 W2MEU	52 W6GCG
2 W0BJV	19 W3OJU	36 W1CLS	53 WZRGV
3 W0CJS	27 W6PMI*	37 W6PUZ	54 WIDEI
4 W5AJG	21 K6EDX	38 W7ILL	55 W7HOY
5 W2ZHL	22 W5SFW*	39 W0DDX	56 W6ANN
6 W9OCA	23 W0ORE	40 W0DO	57 W1SUZ
7 W6OB	24 W9ALU	41 K9DXT	58 W1AEP*
8 W0INI	25 W8CMS*	42 W6ABN	59 W5LFF
9 W1JDQ	26 W4MVG	43 W6BAZ	60 W6NLZ
10 W5MDJ	27 W6CNM	44 V3AET	61 W7MAH
11 W2IDZ	28 W1VNH	45 W9JFP	62 W8E3Z
12 W1LLL	29 W0LTY	46 W0QIN	63 W2BYM
13 W0DZM	30 W7HEA	47 W0OWWN	64 W7ACD
14 W0HYW	31 K0GQG	48 K9ETD	65 K6PYH*
15 W0WKB	32 W7FFE	49 W0FKY	66 W4HOB
16 W0SMJ	33 W6PPF	50 W8LPD	67 K0JJA
17 W0OGW	34 W68JJ*	51 W8TZW	*49

VE7CN	45	XK1GE	30	ZE2JV	26	SM5CHH	20
KL7AUV	44	KH6CTC	30	LU9MA	26	LA7Y	20
VE1EF	42	SM7ZN	29	Z83G	26	VQ2PL	18
VE2AOM	38	SN16ANR	29	CT1CO	24	JASAO	18
KH6UK	37	PZ1AE	28	CO6WW	21	JASBU	17
EI2W	37	SM6BTT	28	LA9T	21	JA1AAT	17
VE1HS	41	CO2XZ	27	LU3OCA	20	JA1AUB	16

W2AOC's beam is on the roof of a fairly high apartment building.

We often get letters asking about activity on 220 in various areas. If you want to know about the New York area you might ask W2DWJ, Elizabeth, N. J. Bill has been bearing down on 220 for some time now. In addition to being choholder of the record (up to June 22) W2DWJ has worked 103 different stations in 13 states.

In a letter dealing with other matters, G2AHL of R8GB mentions that contacts have been made recently between Gs and Swedes on 420 Mc. He says that several were over distances in excess of 600 miles, but at that time he did not have complete information on the two most widely separated stations. We hope to have something official on this soon, so as to be able to bring our DX records up to date. We hear from our 6-meter friend SM6ANR that he worked G2XV May 17. That was over about the shortest possible path between England and Sweden, 475 miles, a bit under the recognized record.

220- and 420-Mc. STANDINGS

220 Mc.							
WIAZK	9	3	412	W8RCI	6	4	700
W1HDQ	11	5	450	W6NLZ	3	2	2540
W1OOP	12	4	400	R6GTG	2	2	240
W1RFU	11	5	480	W6MMU	2	2	225
W1UHE	11	4	385	KSAXU	4	3	550
W2AOC	13	5	450	W8LJD	8	5	475
K2AXC	8	3	230	W8LPD	6	4	480
K2CBA	8	5	315	W8PT	7	3	550
K2DIG	4	3	140	W8SVI	6	4	520
W2DWJ	13	6	740	W8QAC	8	4	740
W2DZA	12	5	410	W8JCS	5	2	340
W3AHQ	4	3	180	W8JFP	7	4	540
W3LCC	8	5	300	W8OVL	2	2	290
W3LZD	14	5	425	W8UED	4	4	605
W3UJG	11	5	400	W8ZIL	5	2	270
W3ZRF	5	3	112	KH6TK	1	1	2540
W4URY	7	5	320	VE3AIB	5	3	350
W4UMF	11	5	420				
420 Mc.							
W1HDQ	8	3	210	W2DZA	5	3	130
W1RFU	8	4	410	W4VVE	6	4	410
W1OOP	9	3	390	W8RCI	4	3	340
W1UHE	3	2	430	W7LHL	2	1	180
W2AOD	6	4	290	W9GAB	5	-	355
W2BLV	11	5	360				

With the Clubs and Nets

The Midwest V.H.F. Club of the Chicago area announced its V.H.F. Man-of-the-Year Award at the National ARRL Convention at Galveston, Texas, June 19-21. The award is given each year to the v.h.f. man or men who have contributed most to the advancement of the v.h.f. cause, in the opinion of the judges. The 1959 award was given jointly to Walter F. Bain, W4LTU, and Ross Bateman, W4AO. Primary factor in this choice was their series of articles on reactance amplifiers. "New Thresholds in V.H.F. and U.H.F. Reception," in QST. W4LTU was also cited for his fine work in promoting meteor-scatter communication on 144 Mc., and W4AO for his moon-reflection experiments on 144 Mc. in conjunction with W3GKP. Both are long-time v.h.f. enthusiasts of the highest caliber.

The Mt. Airy V.H.F. Radio Club, Philadelphia, will have their annual picnic at Fort Washington State Park, Flourtown, Pa., Aug. 9. More details in the Hamfest Calendar elsewhere in this issue.

The Keystone V.H.F. Club of York, Pa., announces a Hibanders Award, available to anyone who works 12 of their members on two or more v.h.f. bands. Endorsement stickers are provided for 50, 144, 220, 420 and 1215 Mc. and up. More information from W3BKH, Awards Secretary.

Six-meter activity is maintained at a high level in the Dallas area through the efforts of the 6-Meter Club of Dallas. K5BAQ writes that at a recent club session an engraved plaque was presented to Gene and Mina Hahnel, W5HOD and W5HOI, who are now moving to Amarillo. They were cited for outstanding service to the v.h.f. cause in their jobs as Net Director and Social Director, respectively.

OES Notes

K1HMU, Farmington, Conn.—Heard XE1GE on 50 Mc. at 1645 EST June 2, when no other DX was coming through. Ham TV station nearing completion.

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	30	8	1175	W8WVY	10	3	600
W1AZK	24	7	1205	W5YYO	5	3	1330
W1KCS	24	7	1150				
W1RFU	23	7	1120	W6NLZ	12	5	2540
W1AJR	23	7	1130	W8QSC	12	5	1350
W1HDQ	20	6	1020	W6DNG	9	5	1040
W1MMN	20	6	900	W6AJF	6	3	800
W1WZY	19	6	875	W6ZL	5	3	1400
K1CRQ	18	6	800	W6MMU	3	2	850
W1AFO	17	6	920				
W1CLH	17	5	450				
				W7VMP	15	5	1280
W2NLY	37	8	1390	W7JRG	10	4	1040
W2CXY	37	8	1360	W7LHL	4	2	1050
W2ORL	37	8	1330	W7JIP	4	2	900
K2GQI	30	8	1200	W7JU	4	2	353
W2AZL	29	8	1050				
W2HVL	27	8	1020	W8KAY	38	8	1020
K2IEE	25	7	1060	W8WVY	35	8	1200
W2AMJ	25	6	960	W8PT	34	8	985
W2DWJ	23	6	860	W8LOF	33	8	1060
K2HOD	23	7	950	W8RMB	32	8	910
W2PAU	23	6	753	W8SVI	30	8	1080
W28MX	22	6	940	W8SFG	30	8	1000
K2CEH	22	8	910	W8BAX	29	8	860
W2LW	21	7	700	W8LPD	29	8	850
W2RXG	20	6	700	W8WRN	28	8	680
W2TTH	19	7	880	W8HVC	27	8	960
W2RQV	19	6	720	W8DVG	26	8	820
W2WZR	18	7	1040	W8ILC	25	8	940
W2ESK	18	5	850	W8JVV	25	8	940
K2RLG	17	6	980	W8GSH	23	8	540
				W8NOH	21	8	975
W3RUE	30	8	975	W8LCY	21	7	610
W3GKP	29	8	1020	W8HVN	21	7	610
W3KCA	28	8	1110	KSAXU	19	8	750
W3TDF	28	8	915	W8GFK	18	7	550
W38GA	26	7	700				
W3EPH	22	8	1000	W9KLR	41	9	1160
W38YF	22	6	660	W9WOK	40	9	1150
W3NKM	20	7	730	W9GAB	33	9	1075
W3LNA	20	7	720	W9AAG	32	8	1050
W3LZD	20	7	650	W9REM	31	8	850
				W9ZIH	30	8	830
W4HJO	38	8	1150	W9LVC	27	8	950
W4HHK	35	9	1240	W9EOC	27	8	820
W4ZNL	34	8	950	W9ZHL	25	8	700
W4AO	30	8	1120	W9HVC	25	7	1030
W4MKJ	28	8	850	K9AQP	24	7	900
W4CMF	28	8	1110	W9HPB	24	8	820
W4VLA	26	8	1000	W9WOL	24	8	850
W4EQM	25	8	1040	W9LF	22	7	82
W4WCH	24	8	850	W9KPS	22	7	680
K4FUS	24	7	765	W9PMN	19	8	800
W4JCI	23	6	725	W9ALU	18	7	800
W4VVE	21	6	720	W9CUX	18	7	800
W4TUV	20	7	1000				
W4IKZ	20	6	720	W8SMJ	29	9	1075
W4OLK	20	6	720	K9EJC	27	9	1110
W4AIB	19	7	840	W9HID	27	7	890
W4CPZ	18	6	650	W9FBF	27	8	1060
W4RFR	18	7	820	W9GUD	25	7	1065
W4MDA	17	6	750	W9TUC	23	7	800
K4TUX	16	8	830	W9QDH	22	8	1240
W4LNG	15	6	1080	W9LNI	21	6	830
W4RMU	14	7	920	W9RCI	21	7	900
				W8TGC	21	7	875
W5RCI	34	9	1215	W8RYG	20	8	925
W5DFU	25	9	1300	W8IFS	16	6	1100
W5LPG	25	7	1090	W9IC	13	6	1240
W5AJC	23	8	1360				
W5KTD	23	8	1200				
W5JWL	21	7	1150	VE3DIR	29	8	1350
W5PZ	16	8	1300	VE3AIR	26	8	910
W5VKH	15	5	720	VE3RQN	19	7	790
W5ML	12	5	700	VE3AAG	17	7	800
W5SFC	12	5	1390	VE3DER	16	7	820
W5HEZ	12	5	1250	VE3AOK	13	5	850
W5FYZ	12	3	735	VE3BPP	14	6	715
W5CVW	11	5	1180	VE7FJ	2	1	365
W5NDE	11	5	625				
W5VY	10	3	1200	KH6TK	1	2	2540

W1HDQ, Canton, Conn.—Back in business with good beams on 50, 144 and 220 Mc. Interested in 220-Mc. DX, and will be on that band as much as possible when favorable conditions are observed on 50 and 144 Mc. Using 4X250B at 300 watts input, phone and c.w., feeding 44-element 4-Yagi array 65 feet above ground.

W2AOD, Flushing, N. Y.—Would like to see more activity on 432 Mc. Stations worked recently on Long Island include W2OTA, Wantagh, W2V8A, Elmhurst, W28CG, Babylon, and K2ASI, Hicksville. Need more activity in W1. Of some 50 stations worked thus far, only one was in northeastern direction. Tuesday and Thursday at 2200 are most popular times for 432-Mc. activity.

W5AZT, Baldwin, N. Y.—Activity improving on 220. Telephone calls no longer needed to stir up contacts.

K2EEK, Flushing, N. Y.—Note increasing use of c.w. and s.s.b. on 50 Mc.

(Continued on page 143)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

SIDEBANDERS in SKIRTS

By Dorothy Strauber, K2MGE

SINGLE sideband operation is very similar to marriage in that, once you have gotten into either, you want your friends to follow your example! That, probably, is why one gal is convincing another to join the ever-growing group of YLs who now operate s.s.b. About three years ago when I first started operating s.s.b., there were only a few regulars, Nita, W0ZTH; Helen, W8SPU; Lenore, W6NAZ; Mary, W1CEW; and Helen, W1FTT. We tried to hold a YL s.s.b. net every Wednesday, but because of the wide divergence in district, this proved unsatisfactory. So we had to content ourselves with as frequent individual contacts as possible. Because of the nature of s.s.b. with its voice control, ease of break-in and ability to get through where other modes of communication could not, it was quite easy to contact our "pioneer" gal sidebanders. And we enjoyed many roundtables with the gals reigning as "mistresses of ceremonies" — a condition which still exists today. Because we're still rather scarce on s.s.b., listen to a gal calling "CQ" and see how quickly a roundtable gets started.

Sideband, to its many devotees, is infinitely more enjoyable than other modes of communication because, despite even the recent crowding, the QRM is never as bad nor as objectionable as it is on a.m. or c.w. The absence of carrier hetero-

*YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.



Meet the author of "Sidebanders in Skirts", Dorothy Strauber, K2MGE, of Lynbrook, New York. One of the most avid sidebanders, Dorothy was the first YL to make DXCC on s.s.b. She and her OM, K2HEA, edit "The Sidebander", publication of the SSB Amateur Radio Association. Equipment at the Strauber QTH includes an HT-32 exciter, 600L final, 75A-4 receiver, MM2 scope, and Gonset tri-band beam.

dynes is a blessing to the ears; the narrowness of the sideband signal enables you to move up as little as one or two kes. if there is interference from a neighboring station; and, most important, if you can't be copied with ease on the upper sideband, you can always switch to the lower sideband.

Another aspect of sideband that appeals to the gals is the simplicity of working DX stations, and not only working them once for a new country, but being able to chat with them time and time again as an old friend. I have held regular schedules with Jane, OQ5IE, in the Belgian Congo for about nine months, during

K2TEX of New York City shunned her OM's (W2CMM) hobby for twenty-five years until the day sideband equipment came into the Binger household. Now one of the most active of the YL sidebanders, "Kitty" has worked more than 70 countries within a few short months. Thanks to single sideband operation, Kitty says, she uncovered the fascination of amateur radio for herself.

DX fishing is a daily pastime of well-known OQ5IE, Jane Hiernaux of Stanleyville in the Belgian Congo. Jane was probably the first YL to go on a s.s.b. DXpedition when she made a recent trip to Uganda, YQ5 land, for some sideband operating from a new locale.

which time we have chatted with each other every Wednesday for at least two hours at a time with neither one of us missing a word that the other has said. For those who like to chase DX let them be impressed by the example of Meredith, W6WNE, who only recently received her license. In the short space of six months she worked DXCC on single sideband!

I had mentioned earlier the small group of YLs who formed the nucleus of "sidebanders in skirts." They, of course, have been joined by many times their original number. K9EBA, Gus, who has set himself a goal of YLCC on sideband, has already worked 88 gals. To be sure, this is just a small percentage of the more than 4,000 girls who are licensed, but the number keeps growing every day. Probably the expense of changing over from present to sideband equipment is the major factor thus far in limiting the number of YLs on s.s.b. Also it is possible that unfamiliarity with tuning s.s.b. has contributed somewhat to the small percentage. If the latter is the case, may I point out that you can tune s.s.b. with most any receiver. Simply turn the knob to the c.w. position, turn the b.f.o. one and a half kc. to the left for upper sideband (which is used on 10, 15, and 20 meters) or to the right for lower sideband (in use on 40 and 75 meters). With a little sensitive adjustment, this should simplify the tuning process and enable the gals to listen in and enjoy amateur radio in its finest form.



K8IGG, Anne Allen of Ypsilanti, Michigan, uses a 20A, Thunderbolt final, Drake receiver, and three-element beam, giving her one of the most powerful signals on s.s.b. Anne is the XYL of W8TAU.



Some of the YLs I have heard most frequently on s.s.b. are W1ZXT, Jo; W2LHK, Aileen; K2TEX, Kitty; WA2AVB, Charlotte; W2SAP, Shirley; W3CUL, Mae; W3GEN, Audrey; W3ICQ, Elsie; K4VRV, Rinnie; K4RIL, Inez; W4BIL, Fran; K4DNL, Olivia; K4ZWW, Jo; K5QZC, Priscilla; K5SPD, Mary; W5BJU, Harriet; K5MIZ, "Al"; K6IKF, Gil; W6NAZ, Lenore; W6WNE, Meredith; K7EYL, Sally; W8SPU, Helen; K8IGG, Anne; W9RUJ, Mary; KØMET, Grace; KØOBX, Cora; and WØZTH/9, Nita. My apologies to the many other gals on single sideband who have not been included; I operate mainly on 20 meters where some of the districts are not heard due to skip conditions, and I've not had the opportunity to bandhop and meet the gals on the other frequencies.

Single sideband may be new but it has proved its worth as a superior means of communication over and over again. It has been said "never underestimate the power of a woman". We feel that if you gals listen to sideband, you won't let the OM rest until there is a change of equipment and you join us. And what a hearty welcome you'll get! See you on s.s.b.!

WAC. YL Note

After August 15, applications for the Worked All Continents YL certificate issued by the Young Ladies Radio League should be mailed to custodian Barbara Houston, KØLYV, General Delivery, Richardson, Texas.

Coming YL Get-Togethers

YLRL Convention

Dates for the third international convention of the Young Ladies Radio League have been set — June 17, 18, and 19, 1960! The Women Radio Operators of New England will serve as hostess club. Onie Woodward, W1ZEN, and Millie Doremus, W1SVN, are co-chairmen. The convention will be held somewhere in the Boston, Mass. area. Details given here as they develop.

ARRL New England Division Convention

New England's big ham event, Labor Day weekend, Sept. 5 and 6, will be held at the air-conditioned Hotel Statler Hilton in downtown Hartford. For YLs, in addition to the usual convention attractions, there will be a fashion-show luncheon in the glamorous hotel Terrace Room, a Sunday morning "brunch", and a meeting of the Women Radio Operators of New England. For XYLs there will be



special entertainment. A spacious suite of rooms set aside as ladies headquarters will afford comfortable lounging and leisurely ragchewing. See page 10 in this issue for registration information.

Kudos

Some of the information which appeared on page 93 under "Traffic Topics" in the June issue bears repeating in this column. In summarizing the record of 1958 BPL traffic handlers, two YLs figured so prominently that it is with pride we point again, on this page, to their inspiring contributions to ham radio.

For the third straight year Georgianna Mesey, W2KEB, has been "traffic champ". Georgie's staggering record reads 478 BPL points for 1958, 345 for 1957, and 282 for 1956. (See article reference above for explanation of BPL points.)

Mae Burke, W3CUL, placed second in BPL totals with 302 points. Mae has the distinction of having made BPL 14 times in 12 months by virtue of making it twice from her Florida location, in addition to making it every month from her home QTH in Morton, Pa. In 1957 Mae received the Fifth Edison Radio Amateur Award in recognition of her outstanding work in traffic handling.

Another YL on the list of the top ten BPLers for 1958 is Bertha Willits, W0LGG, who placed eighth with 164 points.

In an "all time" (post-war) list of the top 25 BPL members W3CUL had better than a two-to-one lead over the OM who placed second — W3CUL, 4070 points; W4PL, 1779 points. W2KEB is sixth with 1376 points. Other YLs recorded among the top twenty-five are W9JUI, Peggy Coulter, and W2RUF, Clara Reger.

Leis and leis of orchids to our top YL traffic handlers for their enormous, unselfish devotion to public service through amateur radio. We can only wonder how they do it.

New Certificate

The Women Radio Operators of New England YL club offers a new certificate for confirmed contact with six WRONE members. Three of the New England states must be represented in the six contacts. All contacts must be made after May 1, 1959 on any band, and contacts must not be made during a WRONE net. QSL cards should be mailed to custodian Isabel Bunney, K1EAV, 47 Pine St.,




The YL Hamfest at Santa Barbara, California, on May 23rd marked the first "all California" YL get-together. Seventy-two YLs representing the San Diego YLRC, the Los Angeles YLRC, the San Francisco YLRC, and the Camellia Capital Chirps turned out to make the affair a memorable one. W6DXI, Gladys, and K6KCI, Irma, were co-chairmen. The photo shows, left to right: W6DXI, K6ENK, K6PWH (foreground), W6WRT, K6KCI, K6JRL, K6OWQ, and W6NAZ.

North Billerica, Mass., accompanied by a self-addressed envelope with sufficient postage to cover their return and 10¢ to cover cost of mailing the certificate. Contacts must be made from one location, with the exception of Maritime Mobile stations. MMs need only work the specified number of contacts, as Rule 1 states, while maritime mobile. A sticker will be issued for contact with WRONE members in the three states not listed initially on the certificate.



Floridora YL Stamp

If you have contacted any of the Floridora girls of Florida, you have probably seen their novel "buttons-and-bows" stamp. The Floridoras have put an added touch of femininity into their hamming by using the stamp on QSL cards, club certificates, on three inch ID buttons to be worn at hamfests, and on skirt material. Contact ten Floridoras for your copy of the attractive club certificate. 

Howard S. Bradley of Hamilton, New York, is a man who obviously has a way with women. W2QHH's technique and persistence have earned him the novel distinction of being the first OM to confirm contact with 1000 YLs. When he recently qualified for YLCC/1000, Howie added still another honor to a collection of awards and certificates which is probably the greatest in all hamdom. As W3VKD states in his *Ham Register*, W2QHH is "one of the most certificated hams if not THE most certificated in the world." See the May-June issue of *YLRL Harmonics* for a feature story on the man who will be glad to talk to a few thousand more YLs anytime.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How?

Complications and confusion encountered in the pursuit of primary QSO-certifications (QSLs) are a never-ending conversation-piece among the DX fraternity. Witness, for example, the steady expansion of "Where" chatter in these monthly DX reviews. "Bill and Jim got their QSLs from 8T8YL, but I didn't — and I worked her first." Woe! But that's the way the cookie sometimes comes apart.

It's not surprising that similar difficulties show up in collecting secondary certifications — "awards". Here's a typical expression of distress received some time ago from W2BU1:

... I was forewarned about the delay involved in obtaining [a certain certification] but I was not aware that correspondence on the subject might be ignored entirely. I am "burned up" because I now find that W3MDE has had a similar experience concerning refusal of credit for one of his cards. He responded by submitting one of his two TI2PG QSLs. No answer to this. Further inquiry resulted in the sponsor's statement that the additional card was never received. So he sent a second TI2PG card. After some eighteen months the certificate finally arrived, but no TI2PG card was returned. Two more years have passed and still no word on the TI2 QSLs. Now I seem to be in for a similar deal. Can anything be done?

This is tricky *caveat emptor* stuff partially treated in our December 1956 "How's" commentary. The cluttered realm of non-ARRL communication certifications is an interesting source of colorful shack wallpaper but it's a field frequently fraught with frustration. Applicants for such diplomas necessarily subject themselves to the administrative capability of sponsoring groups or societies. Add to this formidable variable the risky vagaries of overseas mail.

"Can anything be done?" Well, prior to filing for a given certification, much exasperation might be avoided by consulting with someone who has recently done the same. Experiences of others can properly encourage or discourage you as the case may be.

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We follow a somewhat doleful theme with another sober thought for your midsummer meditations. It's the probable degenerative effect that a decreasing sunspot count will have on future DXpeditionary activity. ZL3DX, for example, ran into mediocre propagation conditions on his recent operational tour of rare Pacific areas. Late reports from a few European and African DXers infer similar radiational unpleasanties. Fingers crossed for the impending Seychelles sortie of W0A1W and VQ4ERR!

Much of the incentive for costly week-end

junkets to remote points will be lost when chances of blank log pages loom large. But do we underestimate scientific progress toward enhancing ionospheric refractivity? In time to come our most ambitious DXpeditions may shrewdly synchroize their activations with operations of the Argus and Smokepuff type. *Crazy, man.*

What?

A general skittishness and some jarring fadeouts color our DX propagation picture for the summer of 1959. Erratic multipath openings on 14 and 21 Mc. bewilder the beam bunch, while at the 28- and 3.5-Mc. extremes of our long-haul spectrum we see the boys being separated from the men. Taking the broad view, however, conditions remain darned good, especially in the opinion of those who can recall the ionospheric famine of 1952-'54. So reports from the "How's" team indicate a continuing high level of activity and proportionate results.

20 phone perks up as the 10- and 15-meter puddles become summer shallows. BV1USC (14,162) 14 GMT. CN8JE, CR6 6AK 9AH* (303) 10. CT1s AY JJ 23, EA9AZ, EL5B, ET2US* (317) 22. FASCF (180) 6. FQ8AE (175) 5. FY7YF* (345) 23. HA5s AM KBR, HHs 11B 2V 2Y. HK0AL of San Andres, HL9KT (150) 13. HR2EZ, HZ1AB*, KA5 2AA 2KS 2QT 2ZZ 8RA 0CG, KB6BH, KC4USG, KG5 4AA 3, 4AL 6AAY 6AFA, KJ6BV, KM6B1* (270). KW6CL* (295) 10-11. KX6s AF BT EA, KX6NA (285) 10-11. LX1DV, LZ1KBA, MP4s BBA* (330) 23. DAA, OA4GG* (310), OD5s AB (158) 4, AU CA, OR6CAV* (300) 19. SPs 3CZ 5HH 0FR, SU1KH (180) 2. SV0WT, TG7CB 9US, T1ET 23. UA1s AB BI DZ, VE3EGD/SU 6QG/SU 8TH*, VKs 9AA (177) 14, 9AD* (309) 10-11. 9YT 0CC* (310) 11 of Macquarie, VP5 1DH 2KR 5CB* (310) 4, 9BN 9DC, VQ5 2GW 2, 5FS* (309) 19-20. VR2CC (175) 9-10. VS5 6AE (175) 14, 9AH* (305) 3, W4GQM/KS4, XE0JD, XW8AL (133) 13. Y03s CV CY, YUIAD* (320) 30, ZB5 IAH 2A, ZC4s CS 2, GT 4X4s AS 1F, 5As 2CV 5TO, 9G1BQ* (303) 0-1, 9K2s AM* (304) 21, AZ (180) 3-4, 9M2s DQ (188) 15 and GA (190) 14 are designated workable by 14-Mc. A3 investigators W2s CVW* GBC (135 worked), HMJ*, W4UO, K4TEA, K6LAE, K9JRR, CO2US, KZ5US (111/80 worked/confirmed on phone), VE5 1PQ and 3EL. Asterisks, as usual, represent single-sideband action.

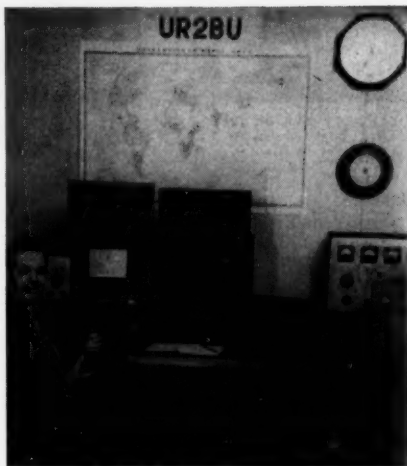


*4822 West Bertenu Ave., Chicago 41, Ill.

20 c.w. accommodates its share of 26- and 21-Mc. refugees in addition to the regular battle-scarred veterans. We find W1s CTW Y1S, K1s DCL EFT (99/67), 1FJ, W2s CTF CVW HJL JGL, K2UYG, W3LOS (204), K3s AHT BVV DPQ, W4CQ, K4s DO (189/175), 1GID (110/92), TEA, W5JPC, K5s HFT (27/4), TER TXW TYW, W6s KG JQB PHF, K6LAE (160/135), W7DJU, K7AWH (95/69), W8s KX NOH YGR, W9s JNN ZYD, K9s ELT HLW (84/54), JJR (89/60), W0QGI, CO2US, EL4A, 1IER, VEs 1PQ (243) and 3EIL (76/50) monitoring their mailboxes for the QSLs of BV1s US (62) 13, USB USC, CE0AC (240), CN2AQ, CN8s in number, CP8s CD (35) 2, CN (80) 4, CRs 4AX 8AR 6CK 7AY (50) 14, 9AH (42) 14, 9AM (82) 4, CT2BO (15), CX6AD (50), DMs 2ADL 2AGB 2AGK 3KQN, DU8 1DR (82) 14, 1MPH 1RTI 6IV 78V, EA8 6AW 8AJ 2, 8BF (21), 0, 8CG (38) 8, 8AC (50) 16, EL4A (W7VCB) 5, ET2VB (48) 14, F8 2CB/FC 9QV/FC, FASRJ 7, FB8s CI/5 (84) 12 just Madagascar, CI (30) 14, XX of the Kerguelens, ZZ of New Amsterdam, FF8s BX (15) 22, BZ, FGTXE (50) FK8AW, FO8AC (62) 6-7, FP8AP, FO8HD, FV7s YE (90), YF (10), GD3UB, HA8s 1KSA 2MF 3KMA 7PZ 8KWG 90X 8HN, HB4FE just Switzerland, HC8s 1XJ (35) 4, 2GM 4IE 7, HH2JY, HK8s 1H1 3TH (50), 4JC 58G (37) 22, 8AI, HL9KT, HR2FG, HSIE, ITIAGA, JA8s 2DO 3AB 3AP1/mm 4HM 5AI 6MW 7IV 7LA 8OF 9AA 9GO 9FZ, JT1AB (62) 14, JZ8DA (50) 10-11, KAs 2KS 9MF 18, 9MW, KC8s (18) 14, K9s 1AQ (22), 1BO, 6AIF (43) 14, 6AIF, KH6BDV, KJ6s, KJ6V but see "Where", KM8s BI (45), BK (65), KR8s AC (30), GY 18, KV4s AA (80) 23-1, BO (90) 22, KW6CU, KX8s CJ (47) 14, CN (18), LX1RA (50), LZ8s 1KLR 2QA 2WD 4KBA, OD8LX (15), OR4RW 8, OX3s MD 5, RH (95) 1, UD, OY8s 1R (44) 6-7, 5PF, PJ2CP, PZ1AM (50) RAEM of Moscow, SUI8S (55), SV8s 1AB 8KX 8WP 8WR, TG9-LM, TI2s DN (80), PZ (50), UA8KAE (62) 2-6, UA8s CB CMJ JR JY KCA KJA OI 8A 4, UA8s CA CD CN FF GF IJ (18), KCA KDA KJA LS/mm, UB8s in quantity, UC2s AA AR CB KSA (60) 17, UD8s AK (51) 21, FA KAB, UF8s BX (210) 2, CC PD, UG8s AG AW, UH8KAA (30), UMBAD, UJ8KAA (25, 80) 14, UL7KAR, UM8s KAB KAS KMB, UNIAN, UO8s AN KAA KP, UP8s KCB KNP, UQ2s AB (78) 6, AE/mm (30), AJ AN AS AT (95), UR2-KCA (95) 5, VEs 3EGD/SU 6CG, SU 8AY 8MB 8NE 8NL, VK8s 9AD (60) 6, 9GW 9NT 8CC, VP8s 2GAF 2GAK 2GD 4RL (65), 5BL, 6CJ 7NA 8CK 9EP 9EN (60), VO8s 2EW (23) 14, 2QR (40) 13, 6LQ (5) 4, RAD 8AF (91) 14, VR8s 1B (75) 12, 2DK, VS8s 1FZ (90) 10-11, 1JU 9GS (30) 17, 9OM, VU2BK, WAGQM/KS4 (58) 5, XE1AAL, XW8AI (83) 15, YO8s 2BM 3AR 3CA 3DQ 3RI, YV8s 3AN 6BI 6BS 6LN, ZB1FA (9) 23-0, ZC8s CS JC, ZD8s 2CUP 2HHT 20, 2VPF (42) 0, 6FX (30) 14, 9AK (50) 16, ZF7JF (45) 14, ZK8s 1AK (22) 9, 1AU (20) 6, 1BG 5, 2AD (48) 6-7, ZP5AY (95) 0, ZS8s 3AC (67) 15, 7M (65) 14, 3A2AF (40) 6, 4SF8s FJ (85) 14, RD, 4X4JM, 9GICX, 9M2s EG (80) 14 and FK (28) 14, K6EC wonders if anyone else has claim to a long-path WAC. "For some months now, I've been looking for South America on the long path and I hit the clincher at 1520 GMT with CX2BT, my beam at 310 degrees." There will be more of this as time goes by!

15 c.w. bears up admirably with W1CTW (157 on 21 Mc.), K1s DCL EFT IJ IIR, K3DPO, K4s DRO IGD OTG/6, K5TER, W6KG, K6LAE, W7DJU, W8NOH, W9UJN, K9s ELT (106) 83, HCX (70/17), HLW LIO, CO2US, EL4A (90/30), 1IER and VE3EIL making away with BV1USB, CE8NE, CN2AQ (52) 16, CR8s 5AR (34) 14, 7BN, CT1AT CX1BT 2, DM2ABR, EA8BF, ET2KY (44) 10, FQVQ/FC (21) 12, FAS7T, GC2FMV, HA7KLL, HK0AI (100) 3, HSIC (44) 12, HZ1AB (38) 12, ITIAGA, JA3BP, KA2CB, KG4AV, KX6BT, KZ8ARN, MP4BBW, OA8s 4FM 8B, OD5s CI LX (35) 1, SV0WY, UA8s 4IF 6LI 8CN 8KAR (63) 9, UB8s AQ KIA (36) 17, UW, UX2AX, UIRAQ (48) 16, UQ2s AN (50) 14, AS (81) 15-16, UR2KAE (32) 1, VP8s 4LQ (120) 0, 5BL 12, 5ME 6AF 6RG 9CR 9DL 23, VO8s 2FC 3CF 4FM 4GQ 4GT, VS1JF, WP4APR, XE1ZA, XZ2TH (49) 12, ZB8s 1FA 2A (22) 22, 21, ZC8s FM GT IP (21) 9, ZD2GUP, 4S7FJ, 5AS7O and 9M2DW.

15 phone, spotty though it may be, keeps K1EFI, W2s HMJ* JGQ, W4UWC* (76 on a.s.b.), K4s DRO OTG/6 TEA (80/43), K5s HFT QA JER, W6KG, K6LAE, K9s HCX (70/17), JJR, CO2US and EL4A mighty busy rounding up CEs 1EK 2DB 3AGI (240) 23, 3NE (65) 23, 4CO, CN8s CGE, CO8s 2US 3KP 8OK 8WV 0, CP8s (235) 4, CR7BC (204) 15, DU1GF (209) 15, EA8CM, EL6D (218) 4, ET2US*, FK8AU (283) 6, FM7s WS WU, FY7YF*, HA8s KQ KFR, HK8s 1NH 1RY 6KA, HH8s 2Z, 5RL, HK3TH (65) 14, HP1SB, HSIE (238) 15, HZ1AB* (245) 15, MP4BBW*, OA8s 7Q (424) 0, 8B (204) 1, OD8LX (30) 3, OE1DH (230) 4, OH8NC (60) 14, OO8s 1H (240) 1, IK (235) 0-1, JT LL (22) 4, OX3BW (230) 16, PZ1s AA AB AG AS, TI2s 1A WD, UB8AI (170) 4, U22AN (230) 5, SV8s 1AB 8WR (245), WK8s VK9BS (248) 14-15, VP8s 1SD (210) 23, 2DA 2KH 2KJ* 5AA (215) 0, 5JW 5KS 6ZX 9L (227) 0, VO8s 2VG 4FM (100), 5EZ*, VR2s AZ (40), BC (230) 5, VS8s 1JO (232) 21, 6DJ (165) 14, XE2s AP HM, YS8s 1MS 3TM, YV8s 3CE 5DZ, ZB2A, ZD6DT (240) 13, ZESJC (210-230) 14, 4X4FZ (23) 23, 5AS7Q, 9M2s DW (170) 14, GA (148) 15 and HC, Asterisks mean sidebar.



UR2BU, one-time E5SD, is a familiar call on higher-frequency DX bands, especially 28 and 21 Mc. Like the rest of us, Karl regrets to note ten-meter conditions on the solar-cyclic wane. (Photo via W2G8C)

15 Novice frequencies find the callow crowd catching many an item that would go well in any General's log. We hear from KN3s 3GIT (42/12), 3HWT 58CT 5UMC and 8NHC about the communicational complaisance of C8s 2BK 8CF 8GT 8JE, CT1s CF 1D, DM8s 2ADC 2AEH 3KIA, EL1DR/mm, HA5DH, HB8s AC FU, K1Hs DAK NF, KL7s CDF CKB WAF, KZ8ARN, LA2JE/p of Svalbard, LUSEN, PA8s DB LOU, UA8s 3ADP 4BDX 7TV, SP5AR, TF2WCV, TIECMU, UA8s 1TQ 4KED 6KOD 9OI 9SB, UR2BU, VEs8s BX PH, VK3TX, VP8s 3AD 4LQ 4LR, WH6DBF, WL7CZU, WP8s AOD AQR, YV5ADP, 4X4CJ and 5AC2V. KN3HWT finds an inside-the-shack dipole sufficient for plenty of DX, so lack of rotaries and rhombics need not deter determined newcomers from their rightful shares of DXotic thrills.

10 phone swerves toward the north-south propagational paths but periodic east-west openings still edify 28-Mc. regulars. K1EFI, Ws 2GBC 3QIR (115/107), CO2US and EL4A traded audio with CR8s 6CA 6CZ 0, 7BB, CT2AC 17, CX8s 1VD 21, 5BR, EA8CP, F88G8, FM7WU 15, HE9LAA 17, KH4BT, PJ2AQ, UO2AN, UR2BU, VP8s 2AR 20, 2GS 2LO 2B 2S, 2SL 3MC 15, 4LA 9VM 9WB, VEs 2NS 2SB 3HH, XE2BM, YU3JN 16, Z88J, ZP8MPC Z8s galore around 20, 4X4IH and 9K2AP. WIGOU reports receipt of his 200-country endorsement sticker from the DXCC desk of W1WPO. That's a lot of phone DX on any band, but Unc confirmed his A3-200 solely on 28-Mc. frequencies beginning in November, 1945. "Tell the new blood to get moving!" exhorts WIGOU.

10 c.w. is a sad story," states K2UYG. "Mostly South Americans on phone." Nevertheless Bill, K9HLW, CO2US, EL4A and IER scrounged up CT1H, DM3IGY, EA9AP, GD3UB, OE1RZ, OQ8IG, OZ2GW, SM8s AJR AJU, SV0WP, UB5QF, UC8s AX KSA, UR2KAA, VP5FP, YU5VL and a stray Z8 colleague here and there. Conjecture is running rampant as to just what we can expect from 10 this fall. Next month should give us a few cews; meanwhile, hang some horseshoes on your beams, eh?

40 c.w.'s immediate DX future seems bright, indeed. This year sees the liveliest 7-Mc. summer in a long time. The mailbox affirms this, for W1YIS, K3HVV, K4IGD, K5s JVF TER TXW, K6DV, W7DJU, W8YGR, W9UJN, EL4A, CO2US and 6.s.w.l. A Ruge report the availability of CO8s 2AJ 2US 5VR 6FA TRV, DU7SV, EA2FA, HA5FO 1, HK5XBX, JA8s 1AEA IAGU IALU IALP IBCO 1BKZ 1BLM 1BQR 1BRK 1BRL 1CBO 1CJF 1CKB 1CMY 1CRQ 1ID 1JH 1LR 1LY 2AA 2AE 2AS 2AEV 2AHH 2FW 2JW 2MA 2MD 2UJ 3AA 3AB 3AF 3AIS 3ARX 3BB 3GN 3GK 3SJ 3WD 4GH 4KX 4LL/mm 4PL 4PE 4PI 4TN 5CZ 6ACZ 6AFG 6BY 6YU 7IL 7Q 7ON 8AE 8GU 8HH 8HO 8LN 9KJ 9QR 9AN, KH6BDV, KJ6s (10) 11, KR8s AK BF, YL 1ZIKRU, OK3MY, OX3RH (2) 0, PY8s 2AOD 5FQ 5LJ 7AHA, SP5GX, curious UA9EE, UA8s FS KCO FPG LS/mm, UB8KEB, UC2AD, UO5WB, VEs 2AQF 2AXN 2CI 2QL 3PE 3YD 4KX 4VB 4XW 5FY 5JE 5WQ, VP2GAK 0, VR2DA (5) 7, W8LYK/KM6, XEs 1ZA 2GH 2HN 2MD 2OO 3BL, ZL3OR, ZS8s 2HI 4UP

(22) 4 and 6AJH (15) 4-5 In the 7-Mc. Novice slot EL4A recently logged WY2ERC, KNs 1JJA 1KCB 3HJC 3HYC 2H0W 4FNO 4GXD 38UT 3TOR 5UWN 8BHL 8KUH 8LIM 8NWR and 9SKB. Ken writes "I'd like to work more Novices but my time is very limited here. Newer operators are noted to call CQ too long, repeat their calls too frequently after QSO is established, and fail to tune carefully enough between calls." Sidebanders logged in Liberia by EL4A on 40's phone segment include W4HKK, W3s LTL YLB, K5LHS, W0s AKR BKL, K0s LAT QAF ZLY, W0s GYY VMN and KL7AG.

Where:

Oceania — FK8AW joins the huge throng of W2CTN QSL-service clients that now include CR4s AHA AX, FK8AT, ZJ0s DA HA, KW6s CP CU, OQ5IG, OX3RH, TI2WD, VKs 2AXY/1h 2FR 9BW 9GK 9NT, VP6PJ, VQs 2EW 3CF 3HH 4AQ, VR2s DA DK, ZB2I, ZD2DCP, ZS7M and 9G1BQ. Obviously, the only way Jack can handle this monstrous detail smoothly lies through the patient cooperation of card-seeking applicants. This means, for one thing, the filing of self-addressed stamped envelopes. From KJ6BV operative K1JSH: "My big problem is not sending cards out, but receiving them. I intend to answer QSLs 100 per cent but, since there will be no amateur here immediately after I leave, it will be difficult to make sure that QSLs are forwarded. Another bother is the fact that some cards are lost in the mails for unexplained reasons, possibly because of improper addressing. Lately I have been asking that cards be sent to my home APO." Roger was scheduled to leave Johnston last month, so DXers still needing KJ6 may have to bide their time. "KW6CGA has the logs of KC6CG, has QSLs on order, and will be glad to help anybody in need. S.a.s.e., please." This hint via W1s NJM and WQC K6EXO, engaged in QSL duties for ZK1BS, finds it easier to QSL 100 per cent off Bill's logs than to check incoming cards against the records. "All ZK1BS cards will be sent to W/K stations via the ARRL Bureau; I am unable to acknowledge QSLs sent to me for ZK1BS. It may take as long as 90 days between QSOs with Bill and my shipments to the bureau."

Asia — "I now handle QSL chores for VU2RM," writes W3KVQ. "At the moment I have his logs covering contacts from June 16, 1958, through April 20, 1959, which include DX contest QSOs. I expect his up-to-date logs in the near future." Ed desires the usual stamped self-addressed envelope from each W/K petitioner. KH6OR informs, "Since 1600 GMT this May 5th, Paul Bedford has been operating in Afghanistan as YA1PB. This is a legal operation and I will handle all QSLs. His log is sent to me daily via 14-Mc. phone." K0s CJF LAE, W7DJU and others rush to affirm the validity of BV1USB's APO 140, San Francisco, Calif., address which appeared in a past column and which was challenged in June QST. K6CJF received his reply in eleven days. K6LAE notes that BV1USB has received over 2700 QLS via the APO 140 route and has sent out some three thousand. For his activity as KR6-RY, W7LQN parted with 2480 QSLs via bureau. George also was called upon to answer one a.w.l. report for every two ham QSLs received. The listeners are still listening! In lines to W1WPO, OK1JX states that he does not participate in the handling of cards for JT1AB; they go direct

(QTH in June "How's"). Together with JT1s AA and YL, now back in Czechoslovakia, Jan is clearing up the last peaky QSL details for that famous DX duo. "Have cleared 1500 487FJ QSLs since the end of March," gasps ex-V81FJ G3IDC. "Still working pile-up of U.S. stations. Maybe I can get through them by November — I hope."

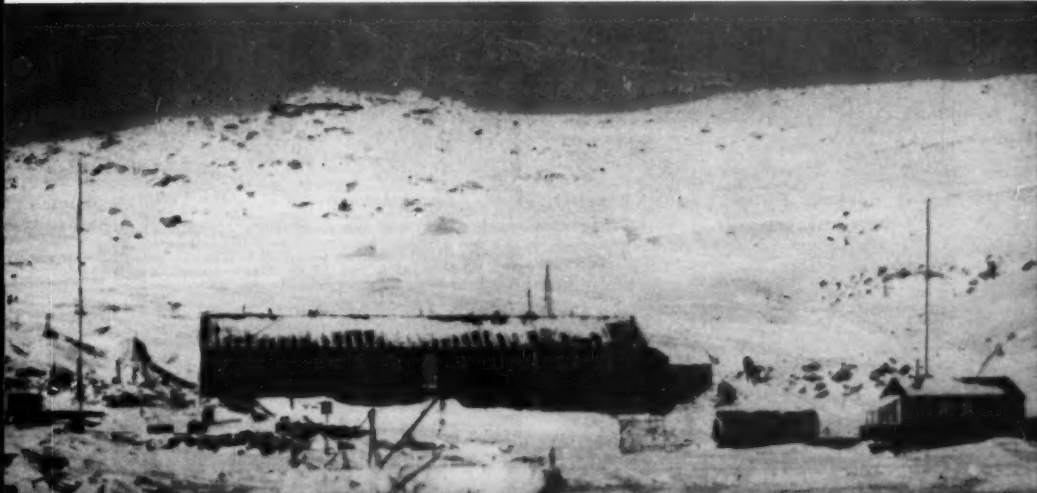
Africa — VERON's DXpress observes that "5As 3TQ 5TF and 5TO have reorganized the Libyan QSL Bureau at P.O. Box 372, Tripoli. They guarantee 100-per-cent results for incoming cards validly made out." WIUED learns from K6LAS that former Tunisia resident 3V8AS closed down by official request. Fred intends to wind up outstanding QSL matters from a new address in France. Events elsewhere in Africa reflect a similar authoritarian mood; see "Whence." From KH6BXU: "ZD0AK of Gough Island says he will be back in South Africa next fall and will tackle his QSL backlog at that time." "FQ8AP confirms that K0DQI now is his QSL manager," notifies W4LHT. "W/Ks should send the usual s.a.s.e." ET2BP (KBJA) assures us, "I will QSL all stations contacted here but due to the terrific pile of contacts this may take a little while. My apologies for any delay. I have just received stock from the printers and have started mailing them out. The first ones to go are replies to those who sent self-addressed envelopes. Others are going via QSL bureaus as filled out by my trusty QSL assistant, the XYL."

Europe — By the end of June, K9ELT was well on his way toward completion of GB3GD Isle of Man QSL contracts. "If your card was sent without IRCs, stamps, or self-addressed envelope, reply will arrive through the bureau route." I1A1M, aiming to sign I1A1M/ip on Lampedusa island last month, specifies his home QTH as QSL address. Monaco maneuvers by G3s ATU HCL and LKZ may occur this month as indicated in "Whence", call undetermined at this writing. G3LKZ states, "QSLs via RSGB will be acknowledged on receipt, direct if IRCs are included, otherwise via bureau." TF3PT's letter to W8KX confirms that TF3AB has succeeded TF5TP in managing the Iceland bureau.

South America — Add FM7WP to the preceding rundown of W2CTN's QSL-agency clients. VE3MR of Caribbean DXpeditionary renown writes from home base once more. "On my return I was greeted with two large bags of mail containing over 3000 letters and QSL cards. Please reassure all that QSLs for my part of the operation at T19s CW SB, PZ1MR, FY7YF, VP3RO and PJ5AC started hitting the mails around mid-July; most T19SB cards have been mailed already. All QSLs for QSOs with T19s CW and SB should go to TI2HP with self-addressed envelopes and IRCs enclosed for fast replies. Regarding FY7YF, especially note that cards for sideband contacts go to VE3MR, cards for c.w. work via W2FXA, Gaby's Stateside QSL manager." WIUED is told that the license of OA4EP has been canceled; also that OA4s CDA and GH are calls which have been illegally used.

Hereabouts — VP6WD (ex-G2WD) is struck by the excessive postage appearing on some envelopes bearing QSLs for him. Mac finds it quite convenient and economical to have his QSL imprinted on standard international airletter forms. Open one up and there's your QSL ready for cropping if desired. "And I do wish that stations I work would not make vain promises about QSLing 'at once' — ninety per

Real cool, cats. Our QTH of the Month is South Orkneys Base "H", Falkland Islands Dependencies Survey, currently the quarters of VP8DT. You can credit W9WHM for tormenting you with this lovely hot-midsummer-night's dream.





cent of all this is just not true. At the moment I have cards for seven such countries waiting to go off. Since first becoming an amateur in 1924 I have always sent cards for all QSOs but now this resolution has been made: Unless I get a card, no card will be forthcoming from me. I cannot afford unnecessary expense now that I am retired from professional life." KØRDO, a relative newcomer to DX ranks, finds IRCs no panacea for slow QSL returns. John would like to strike at the heart of the matter and find a way to obviate the need for certified proof of QSO when filing for secondary certifications. Any ideas? Until the right scheme comes along, K2UYG recommends W2SAW's DX Stamp Service (p. 76, April QST). "It surely works!" Concerning his QSL labors on behalf of VP2KJ, W8MXS writes, "I'm using the usual set-up. S.a.s.e. for Stateside contracts get immediate replies, foreign applications with IRCs enclosed are answered by air mail, and all others go through the QSL bureaus." Never having operated 15 phone, K8KAV's receipt of an OQ5HS confirmation leads him to suspect that his call has been pirated. Jeeves lays it to poor phonetic identification by someone who could dearly use that QSL VOIBD should be flipping FP8AY switches right about now. "All cards received will be QSL'd and should go to my home address." K6LAB recommends profuse use of fresh-off-the-press U.S. commemorative stamps on your outgoing QSL-soliciting mail. Good idea, for it's an odds-on proposition that stamp collectors lurk in the family circles of most rare-DX ops.

. K5JVF fears that those holding their breaths for 7-Me, HH2HB cards will never make it. And we'll never make it if we don't get right down to QTH cases, like so:

BVIUSB (see preceding text)
BVIUSC, Navy 3840, FPO, San Francisco, Calif.
CB0AG (via CE3HL)
CP3CN, P.O. Box 651, Oruro, Bolivia
CP5AF, J. Servi, P.O. Box 1164, Cochabamba, Bolivia
DL4KL, K. L. Broga, APO 109, New York, N. Y.
ex-DL4RH (to W1JZD)
DL9HX, O. Glaser, Waterloostrasse 29, Augsburg 10, W. Germany.

ex-DM2AJG (to DM2AVN)
DM2AVN, H. Adler, Box 37, Strausberg, I. D.R.
DU1MPH, Fred Selas, Box 3440, Manila, P. I.
ex-EA9BM (to EA5FU)

EA9DE (via W2KUE)
EA9DG (via URE)
ET2BP, B. J. Perman (KØJAI), USA MESCA, APO 843, New York, N. Y.

FB8s XX ZZ (via FB8BC)
ex-FB8AE (to FK8AW via W2CTN)
FB8BX, Chaloup, Box 6089, Dakar, F.W.A.
FK8AW (via W2CTN)

FM7WP (via W2CTN)
FO8AP (via KØDQI)
FO8HD, Box 894, Brazzaville, Fr. Eq. Afr.
FR7ZD, G. Hoarau, Tampon, Reunion Island

HA5DD, D. A. Herner, Bogdani UT-24, BL-4, Budapest 3, Hungary
HC1JJ, P.O. Box 691, Quito, Ecuador
HC5BO, P.O. Box 55, Cuenca, Ecuador

IIAIM (p to IIAIM)
K6CGG (to KW6CGA)
KJ6BV (see preceding text)
KL7AL, Bill Hinton, Box 488, Nome, Alaska

ex-KR6RY (to W7LQN)
KR6US, YU-3 WPDU, Navy 3867, FPO, San Francisco, Calif. (or via WJGJ8)
KW6CA, I. C. Lundblom, CAA, Wake Island

LA3SG, p (to LA3BG)
LX3PF (to DL9PF)
PAØRE, D. Vermeulen, P.O. Box 19, Beest, Netherlands
PJ5AK (to VE3MR)

PY5HJ, F. Terran, Box 1455, Curitiba, Parana, Brazil
TF6WEI, 933rd ACWRON H-3, APO 81, New York, N. Y.

ZD7SA's "new look" comes courtesy W9YSX. Compare that neat and solid sender with the breadboard model in the photo on page 66, November 1958 QST. Bob's amazing performance as Mr. ZD7 makes St. Helena delightfully workable for thousands of the DX faithful. W9FYJ (ex-CN8GU) also must take another bow for many hours of labor contributed to the ZD7SA QSL cause.

TI2PZ (via KØDQI)
UR2BU, Karl Kallama, Oblast 091, Tartu, Estonia S.S.R.
VE6GI (via VE6UP)

VP2AR, Hood St., St. Johns, Antigua
VP2GAK (via VP2GW)
VP3RO (to VE3MR)
VP5JW (via KØLFFY)

VP9EP (via VP9BLA)
VO4FM, J. Stewart, Box 1313, Nairobi, Kenya
ex-VS1JF (to GW3LQP)

ex-VS1KB, M. Fender, RAF Det., Labuan, No. Borneo
VS5GS, G. Scott, Soas College, Brunei Town, Brunei via Singapore

VU2RM (via W3KVCQ)
XE2GH, G. Villarreal, Box 44, Reynosa, Tamps., Mexico
XE2AD, U Hla Oung, 116 Inya Rd., Rangoon, Burma

YA1PB (via KH6OR)
YK1AT (via CAV, attn. OK1HI)
YU3WP, V. Faleric, Box 81, Maribor, Yugoslavia
YV5AEW, P.O. Box 1049, Sabana Grande, Caracas, Venezuela

YV5AFR, J. Rotellar, P.O. Box 2299, Caracas, Venezuela
ZBIUSA, H. H. Wheeler, FASRON (Spec) 201, Navy 240, Box 4, FPO, New York, N. Y.

ZD6NJ, c/o R. Wilder, Box 476, Salisbury, So. Rhodesia
ZD9AK (via SARL)
ZK1BS (via KØEXO)

ZS6AQA, S. Shapero, c/o W. G. Lay, Carlton House, Johannesburg St., Johannesburg, Tvl., So. Afr.
ex-457RD (to G3KUD)

9G1BM, B. A. Willbraham, P.O. Box 177, Accra, Ghana
9G1CZ, N. Semmens, Box 128, Dunkwa, Ghana
9N1AA, H.R.H. King Mahendra, Royal Palace, Katmandu, Nepal

All hail W1s WPO WQS YIS, K1HK, W2s AMS CDP CWV HXJ JBL, K2UYG, W3s AXT QIR, K3BVV, W4LTH, K4TEA, W5JPC, K5JVF, W6s DTJ KQ PHF, K6s CJF LAE, W7DHU, K7AWH, W8s KX NOH, K9LHW, KH6BXU, OK1JX, L. Waite, A. Rugg, DeRidder (La.) DX Club, DX Club of St. Louis, Japan DX Radio Club, Newark News Radio Club, Northern California DX Club, NZART, Southern California DX Club, VERON, WIA, West Gulf DX Club and Willamette Valley DX Club for enabling us to assemble the preceding directory. Have you helped your brethren lately?

Whence:

Asia — More on this Nepal thing from W1CJ via W1LVQ: His Majesty, King Mahendra of Nepal, intends to hit the air waves as 9N1AA at any time now with a Pacemaker and Thunderbolt on 10-, 15- and 20-meter sideband. W1CJ's outfit, Advanced Communications Engineering Company of Washington, a subsidiary of Cook Electric, Chicago, is installing a communications system in that country. Fine ambassadorial work at the ham level. Ceylon jottings thanks to W2CDP and 457FJ: YL 457YL sticks to phone with her 813, long-wire and AR-88 on 20, 15 and 10 meters. RF club group 457FM has 897s, a long-wire and AR-88 cookin' crystal-controlled fashion on 20. Neighbor 457RD, readying for return to G3KUD, likes 20 with his 6L6, dipole and AR-88. Frank, himself, wheels 457FJ around on 3.5 through 28 Mc. with a 6146-like final, Zepp radiator and Eddystone 888 inhaler. "Since the end of March, when licenses were restored here, I have managed to work 140 countries and confirm 72. I look forward to working WAS from Ceylon if possible in the limited time I have available. Conditions here are very good on 20 and 15 although 10 has just about closed. By the way, RAF finishes in Ceylon at the end of this year; then the Maldives will be permanent base. No activity yet from Car Nicobar." "Ex-F18AZ now is F9TX and soon will become F9GL," notes K2UYG. K4DRO and others have SVØWB and associates scouting around for additional



郑5CF now shoots for the 250-country mark with his 90-watt 807's rig, NC-173 and beams on 14, 21 and 28 Mc. Fred's wife, ZP5ET, also knows her DX onions. (Photo via W3ICQ)

Eurasian DXpeditionary objectives. . . . "For the record," writes OK1JX to W1WPO, "JT1AB, a Czech in Ulan Bator, inherited all of JT1AA's gear. Another station over there, JT1KAA, is a club affair working mainly on 7 and 3.5 Mc. Without much DX possibilities. . . . For would-be KR6is, KR6RY (W7LQX) advises, "To obtain an Okinawa call it is required to hold a Stateside license and comply with necessary security regulations and installation requirements for the area in which the gear will be located."

. . . . Through K6LAE, BV1USB emphasizes that third-party traffic on amateur bands in his area is taboo. MARS does a booming business, though, on adjacent channels.

. . . . KH6OR discloses, "YA1PB came on with a.m. only, for he had no key with him. His receiver is a BC-348 and his transmitter an ART-13, so 14 Mc. is the highest amateur band he can work. YA1PB goes on the air immediately after commercial schedules at 1545 GMT but in the near future his operating times will change due to work requirements and it is hoped that soon he will be able to operate at times more favorable to W/K stations."

. . . . W6LJH learns he is the first Six to nab the Shizuoka A-2 certification, JA2JW doing the administrative honors for this one. . . . K0ACH, at Tuslog Det. 28, APO 324, New York, N. Y., often scans the 20-meter phone band from his post in Turkey where he reports receipt of hefty signals from Ws 1ZEQ 4FLZ 4ITW, Ka 2BSM 3BQZ and 4PVB.

. . . . W9VCH, formerly of KA4AS, is off to Japan again and expects to become a KA2 with c.w. and sideband, a KWM-1 on 14, 21 and 28 Mc. . . . Asian shorties via the societies route (ISWL, MARTS, VERON, WGDXC and WIAI): VU2CQ is said to be mulling over Bhutan DXpeditionary possibilities. . . . VK3RJ notes that 4X4WF formerly signed SP6WF. . . . VS6s AE CG, V87NX and VS1HU lead the VS-land DX pack with 189, 166, 149 and 111 countries respectively. Top phone-only totals: VS2s DQ DB, VS9AH and VS1AY with respective totals of 171, 121, 102 and 101. VS1HS apparently is one-band champ so far. . . . VS9OM should remain active until November on 14-Mc. c.w. with an a.m. session now and then. . . . Japan's deep-freeze entry, SJ1AA, is regularly battled over on 20 c.w. . . . VS9AH may have his new DSB-100 on phone by the time this gets around.

Africa—An apparent realignment in licensing procedures and requirements closed off most Eritrea and Ethiopia amateur operation in late May. ETs 2US and 3XY were exceptions. . . . EL4A finds DX conditions quite good at Roberts Field. "Only a few days of dead bands and two rig breakdowns. In my first nine weeks as EL4A it's 90/30 on 1232 QSOs. Also have three continents on 40 meters."

A recent Singapore hamfest brought together (front row, left to right) visitor W4EWS, VS1s FZ DO AY AD, 9M2DB, VS1s HU and HS; (rear) VS1HX, Tan Chin Hock of Singapore Telecoms, VS1s JW AZ JO JT HY JR HW JF and GC. Key "How's" contributor W8KX obtained this photo from VS1FZ who now needs only Rhode Island and West Virginia to round out his 14-Mc. c.w. WAS.

. . . . "VQ2RB hunts for Alaska almost daily on 14,055 kc. around 2300 GMT," says K2JTG. . . . K6a CQF LEW and LWS aim seriously for Aldabra activation before or shortly after 1959 fades away. . . . W6PHF was glad to be ZD9AK's first long-path California QSO from Gough.

. . . . EA8CF tells W3QIR he's off to Spain for a year or so. . . . "I plan to leave Belgium in August and arrive in Ruanda-Urundi and the eastern part of the Belgian Congo at the beginning of September," communicates ON4UN (W8PTD). "I already have the necessary visas and foresee no difficulty obtaining authorization to operate a portable ham rig in Belgian African territories. I also hope to be able to receive the same type of authorization for Tanganyika. I will be running only 10 watts and most probably will be on in the evenings local time, afternoons for W/Ks. I will be most appreciative of any U. S. QSOs while in Africa. Perhaps I will be able to use my Stateside call with the appropriate prefix tacked on, 14,050 kc. or vicinity preferred. At any rate, I'll be in the Belgian Congo for six months doing research for my Ph.D. thesis."

. . . . K6FK and VE3DMU chorus Z86IF's plans for Z87 Z88 and Z89 DXursions in the next three months. You probably recall Lambert's successful Swaziland sojourn last autumn. VE3DMU adds, "Z86IF extends a cordial invitation to any W/K/VE who would be interested in joining him. Anyone with a.s.b. equipment would be particularly welcome."

. . . . "FQ8AP, by now back in Paris, may remain in France or head for Tahiti or the Belgian Congo in six months or so," remarks W4LHT. "Serge logged some 5000 QSOs as FQ8AP, more than two thousand with W/Ks."

. . . . CR7s BN and LU, through W1WPO, invite your participation in the Beira (Mozambique) International DX Contest to be held between 0000 GMT, the 15th, and 2400, the 25th of this month, a combined phone-c.w. affair. The contest call will be "CQ/B" on c.w. "CQ Beira Contest" on phone. Briefly, everybody works everybody once, no more than ten stations per ARRL DXCC List country, and points per QSO vary with the location of the station worked.

In fact the scoring is so tricky that we urge our contestants to rush requests for the Test brochures to P. O. Box 874, Beira, Mozambique, Portuguese E. Africa, in order that entries can be properly prepared and shipped before the closing deadline, October 31st. Awards, including impressive cup trophies, await high scorers.

. . . . DXCSL, ISWL, VERON and WGDXC supply these Africa items: FR7ZD is reported well heard near 14,100 kc., a.m. with a.s.b. in prospect. . . . EA9DG joined the Rio de Janeiro parade, while curious EA4D95 radiates on 14 Mc. from Cueta. . . . CR7BS is said to be the sideband ice-breaker in Mozambique. . . . FB8CD expects to remain on Mayotte Island for another two years and is most active on 10, 15 and 20 between 1500 and 1800, enrapturing Comoros hunters by the score.

Oceania—Brunei gossip via K6LAE: VS5GS, workable on 20 c.w. around 1300-1400 GMT, complains about tail-enders who start QRMing right after he establishes contact with some other station. He likes to chat and he threatens to blacklist mid-QSO breakers-in. Also, when he calls "CQ NO USA/JA" he really means it. It is factual; modern competitive pressures notwithstanding the normal right of rare-DX types to work anyone as long as they please, has never been abrogated.

. . . . North Borneo note from KH6BXU: "VS1KB, a principal operator at RAF clubber VS1GZ, departs for ZC5-land for a six-month stay. Mike will operate 144, 21 and 28 Mc., phone and c.w., possibly as ZC5KB."

. . . . VR6AC describes 28-Mc. rig difficulties in a letter to W3QMG. Floyd's transmitter hits 14 Mc. okay but really flips when he tries it on 10, ordinarily his favorite range. W3QMG wonders if any archaic electronics engineers among the readership would care to volunteer consultation. . . . VK9VM broke an eight-month QSO fast by working his Stateside QSL manager, K2QXG. He's available for T.N.G. credits almost daily now, 14,050 kc. between 1000 and 1200 GMT. . . . KZ5US made off with the seventh WAKI certification issued by the K6GAF Kwajalein gang. . . . W1WQC observes KW6CGA NCSing a Pacific phone net nightly on 14,210 kc. at 0700 GMT. . . . NZART, WGDXC and WVDXC donate sundry snippets: ZL1PPJ had a lively activation at the



Pan-Pacific Boy Scout Jamboree in Auckland this spring. ZL1s AB ADZ AFW AKW ALB APL AFM ATM AU CH GH KG MQ MT OF TB and VA rolled the ball from 3.5 through 50 Mc, c.w., a.m., s.s.b. and radioteletype. . . . ZK1BS scheduled a six-month holiday from Rarotonga commencing in June. . . . CR10AA's DX activity remains negligible because of illnesses and a heavy bread-and-butter routine.

Europe — WASM-seekers will be heartened at news via K2QXG. From 2230 GMT, the 15th of this month, to 2400 on the 16th, Swedish stations will be on in force calling CQ-W/K and indicating their lan (county) locations with appended suffixes. K2QXG clinched the second WASM diploma award to a U. S. Two and recommends it as a worthy shack adornment for the discerning DXer. . . . This month also sees the 3rd Columbus Marathon Test getting away under the auspices of ARI's Genoa chapter, running from 0801 GMT, August 3rd, to 2530, October 12th. The object is for non-Italians DXers to collect I-contacts and vice versa on phone and/or c.w. So far as W/K/VEs are concerned, RSTs or RSs can be swapped with each I-lad but once over this period, and one's final score is simply the total of I-stations worked. For further details on participation and a description of awards available, address inquiry to Associazione Radiotecnica Italiana, Genoa Section, Casella Postale 346, Genoa, Italy, attention I.M.T.

. . . . After his successful LX3PF venture, DL9PF informed W6KG of Andorra intentions. . . . From SM5AHH: SM5WN/LA/p forsakes Svalbard on the 10th of this month and is supposed to show up in Sweden around the 15th. . . . W8IV tabulates his 14-Mc. c.w. collection of Russian stations at 300 or so. . . . I am going to Jan Mayen in July, We leave Norway on the 5th and I hope to come on the air about the 20th. I will have my c.w. and s.s.b. gear along and will sign LA38G/p for one whole year. . . . Enough r.f. may head Kjell's way to melt the snows up there. . . . WICTW declares this year's Helvetia-22 contest an outstanding success for his part. Cal captured 16 of the 22 Swiss cantons and will be eligible for his 21-Mc. H-22 tapestry as soon as he confirms Neuchatel. . . . Yugoslavians YL YU1OE was encountered by K4TEA on 15-meter c.w. . . . CT2AH entertained visitor EL4A recently at Gambia. Ken found this Azores entry sorely in need of T-21, 807, 6C5, 6J5, 6L6G and 5Z3 spares for his hardworking exhaler. . . . K2UYG discovered friend K2AFL pushing buttons at TF2WD8. . . . W8KX gallantly rode to the rescue of F2CB/FC's ailing AR-88 with a service manual, service hints, and tube spares. . . . TF3PI tells W8KX he has passed the half-century mark in friendly DX competition with near-by TF3MB on 15 c.w. Fall also tries phone occasionally, and enjoys being a "new one" for the U. S. Novice gang on 21 Mc. . . . Between the 23rd and 30th of this month G3s ATU HCL and LKZ hope to sign a 3A2 call on 20, 15 and 10 meters using c.w., a.m. and s.s.b. If conditions are favorable a flock of contest-type QSOs are in prospect. . . . IJAM intended an operational escapade to the Pelagians early last month with a 50-watt, rotary beam and suitable generator. . . . DXCSL WGDXC and WVDXC offer these Continental capsules: OK1MB is giving up the DX sport for a spell. . . . W8UQV and friends scheduled a Monaco stop in July after their planned San Marino strike. . . . SV8WP is due back home by November and is doubtless eager to renew his heavy W3UTC DX assault. . . . We regret to note the passing of PABGN, an old-time DXpert thoroughly worked world wide.

Hereabouts — VE3MR, catching his breath and resting his tired tonsils after a whirlwind DXpeditionary swing southward, breaks down his 5500-QSO Caribbean loggings as follows: T198B 1100, T19CW 1200, P21MR 1200, FY7YF 600, VP3RO 700 and PJ5AC 700, most of these solo s.s.b. style. Whew! . . . Don't forget the 4th Annual Northwest DX Get-together at Portland on the 22nd-23rd of this month as mentioned in our previous column. W7FZA and associates have lined up a truly gala program for your pleasure. . . . W1WG and KP4KD checked their mountainous QSL collections and declare themselves qualified for DXCC² representation. . . . From KZ5US: "The C.Z. lost one of its finest DXers when C.W. Bud Budworth, KZ5LB, left for greener DX pastures in Guam a few months ago. Bud awaits his KG6 tag



RAEM and UA3DQ are Russia's most prominent polar amateurs, the former holding decorations for wireless heroics performed in the Arctic long ago. UA3DQ recently concluded a rugged stint in Antarctica as UA1KAE. (Photo via W5WNW)

and soon will be back on 20 c.w." KZ5US reached the 75-country mark on 28-Mc. phone, then switched to 14 Mc. for a climb to 111/80, all this with a mere twenty watts. . . . QST colleague W1QON reports her brother-in-law, W1EXY, in the midst of a three-month Caribbean cruise with the Coast Guard. Bob signs W1EXY/mm aboard cutter Casco on 21,380 and 29,000 kc. . . . W9ZYD observes that much of the pile-up grief confronting rare-DX operators comes of their making. Carelessness with SK, K and KN procedure signals can really bring down the house. . . . "How's" contributor W1ARR, lately WIARR/6, now strikes out for DX pints after completion of military schooling. . . . W4IUO rejoins our team this month after an eight-year DX abstinence, and K2DFV makes a comeback after five years of QRT. "I'm really havin' a ball!" . . . VP8EP's return to England from Halley Bay is confirmed by W8NOH. . . . Technical trials and tribulations among the readership: It took a BCL to convince W7DJU he had transposed the director and reflector when he erected his new rotary beam in Bellingham. Dale gets out much better, now. . . . K4PHY's rig, wired by a friend when Charles was awaiting his Novice ticket, has worked over 100 countries in two years. Now K4PHY learns that what he thought was a potent parallel-807s final really was a single 807; one tube, inadvertently left out of the circuit, was gold-bricking all the while. . . . W9BRD's prewar claim to goofball fame includes operating a whole year on c.w. with full a.v.c. action on a modified all-wave superhet. The lid finally disconnected the load resistor, disconnected it, and began to hear something through the local QRM. . . . W2HMO finds ex-KL7BGA single-siding on 20 as KH6OES. . . . W4CYKY reports plenty of competition from near-by YL W4KYL who now is past the 150-mark. Spurious birdies from mistuned commercial transmitters gripe J.B. on 20 c.w. "Best DX lately? Turning an icecream freezer on the back porch, five grandchildren after me with flying saucers. . . . Former clients of one-time ARRL DXCC Deskier WBRWS will find John hanging away at the stuff as W4ZEBZ. His predecessor at those ARRL Hq. duties, W1QMI, still goes strong out west as W6JQB. . . . QSOs between VP9L and W4A2AE, who is professional comedian Jackie Jay, resulted in a two-week Bermuda booking for the latter. . . . CO2WI tells K5JVF he combs 40 c.w. every week end in hot pursuit of western United States. Fellow countryman CO2US will conclude a visit to the States this month. . . . ARRL

(Continued on page 140)



F2CB/FC already has a 105/85 DX tally in little more than a year, this despite the inroads of W/K callers seeking Corsica. Gilbert does right well with just 50 watts, an AR-88, and modest skywires. F2CB/FC is most active from 1900 to 0000 GMT on 7, 14, 21 or 28 Mc. as befits conditions. (Photo via W8KX)

QST for

VE/W Contest—1958 Results

HERE are the final standings of Montreal Amateur Radio Club's 1958 VE/W Contest held last September 27 and 28.

The top score came from north of the border, as VE2NI keyed the University of Toronto's VE3UOT to 132,468 points by virtue of 581 QSOs in 57 ARRL Sections. Other Dominion high-points: VE2BN 109,440, VE3QE 103,632, VE4SX 96,615, VE3AJU 96,564, VE3BNF 95,844, VE3BOH 81,324, VE3DDU 66,750, VE1ADH 63,600, VE3AGX 59,500.

Sacramento Valley's K6SXA paced U. S. entrants with 103,806 points. Other Yank leaders were: K9ALP 99,420, W9NII 87,236, K9BLY 76,109, W9DYG 75,539, W5LGG 75,053, W9PZT 73,590, K2MWK 71,641, K6QHC 64,980, K4LTA 64,335.

The following tabulation was prepared by the MARC Contest Committee. The figure after the call is the final score. The amateur heading each ARRL Section listing earns a certificate.

Maritime			
VE1ADH	63,600	VE3AQD	11,600
VE1EK	42,864	VE3DLS	11,583
VO2NA	31,848	VE3EGG	11,136
VE1PB	10,179	VE3CEJ	10,512
VE1HZ	8,421	VE3DPC	5,800
VE1ZI	6,512	VE3DU	4,686
VO2VZ	5,220	VE3RWL	3,186
VE1DB	4,914	VE3GI	2,703
VO2AA	2,832	VE3EIX	1,683
VE1OM	2,280	VE3AUU	1,140
		VE3EIL	1,141
Quebec		Manitoba	
VE2BN	109,440	VE4SX	96,615
VE2NR	53,508	VE4MJ	52,212
VE2AHW	37,779	VE4XJ	10,989
VE2AZT	30,456		
VE2AEW	29,952	Saskatchewan	
VE2BK	21,381	VE5DZ	39,904
VE2AQO	20,094	VE5QC	17,292
VE2PZ	16,065		
VE2AWR	7,308	Alberta	
VE2AJD	7,056	VE6HQ	36,621
VE2AZP	6,708	VE6TT	24,816
VE2ARA	5,575	VE6UN	17,136
VE2RL	5,346	VE6TY	7,416
VE2JL	2,290	VE6HH	4,290
Ontario		British Columbia	
VE3UOT ¹	132,468	VE7EH	57,228
VE3QE	103,632	VE7AUA	53,070
VE3AJU	96,564	VE7PT	53,404
VE3BNF	95,844	VE7CQ	33,600
VE3BOH	81,324	VE7JO	19,780
VE3DDU	66,750	VE7ACP	16,482
VE3AGX	59,500	VE7AC	8,892
VE3BFF	58,752	Yukon/N.W.T.	
VE3EBB	53,958	VE8TO	50,400
VE3AD	51,480	VE8EJ	27,135
VE3AEM	46,920	VE8SI	18,900
VE3BLU	45,686	E. Penna.	
VE3MI	43,542	W3GYP	56,605
VE3EU	40,880	W3FHR	50,251
VE3AVS	30,552	W3HIZ	42,675
VE3YV	36,960	W3DV	35,700
VE3BLY	36,060	W3AXA	32,490
VE3CGL	33,400	K3AHT	24,692
VE3RIW	33,000	W3ADE	23,393
VE3DH	29,798	W3ARK	19,119
VE3BUR	27,852	W3BQA	17,906
VE3ELO	23,088	W3HF	15,920
VE3DWN	21,320	K3ALL	15,365
VE3DYJ	19,152	W3PFY	8,993
VE3BUU	16,340		
VE3CKR	11,800		

¹ Labrador winner. ² VE2NI, op.

Non-competing: VE2CZ, VE3CLR, VE8JW, WIRAN, W5FEM, K9CAN, K9APS.

W3YYL	4332	K9GDF	7581
K3BFQ	217	W9HDH	1949
Md.-Del.-D.C.		No. Dak.	
W3AYS	61,731	K8CNC	6227
W3KLA	59,782	So. Dak.	
W3HQU	53,609	W8FOQ	11,370
W3HVL	53,320	Minn.	
W3MSL	52,743	W8RLI	21,548
W3DKT	17,870	K8IDV	14,401
K3CBQ	10,722	K8MLB	7900
K3CWF	7,118	K8HHH	7448
W3HRE	6642	K8GCN	101
S.N.J.		Ark.	
W2EXB	34,873	K5JPB	40,288
W2QDY	29,890	W5DRW	8664
W2UAP	9380	W7BED/5	7310
K2RNR	4061	W5BYJ	3754
W.N.Y.		La.	
K2MWK	71,641	K2OWE/5	22,666
K2SIL	58,482	Miss.	
W2MTA	43,320	K5HN	44,349
W2UHV	27,292	W5AMZ	42,887
W2GSI	26,967	W5DQK	15,541
K2MES	21,250	K5EXW	1444
K2MWM	22,741	Tenn.	
W2TPV	20,216	K4LTA	64,335
K2KKI	11,372	W4NBV	53,284
K2VPB	9747	W4VNE	39,313
K2IMK	8418	K4PHV	22,900
K2UHL	5524	W4PHW	15,054
K2VRO	5198	W4CLO	5523
W2SAW	3224	Ky.	
K2UCF	3179	W4KVX	30,866
K2UZI	2383	K4PPK	10,469
W2FPW	1083	Mich.	
W. Penna.		W8FAW	39,475
W3NCF	41,262	K8KVV	37,151
W3RNI	27,288	W8CCD	36,768
W3KUN	18,744	K8UCN	35,992
K3AFY	10,289	K8HFO	11,293
W3KQD	9830	K8IAH	2920
W3DWP	6498	K8UCZ	1100
W3DQN	3574	Ohio	
W3LWW	2127	W8AJW	61,893
W3GKY	1625	W8YGR	32,490
KN3CZT	433	W8DWP	31,190
Illinois		W8BDO	20,794
W9NII	87,236	K8BXL	19,061
K9BLY	76,109	K8HBN	16,245
W9PZT	73,590	K8GWK	13,808
W3PNE	63,843	W8SVL	12,635
W9LNQ	61,081	K8IPS	9546
K9IND	48,521	W8YPT	8123
W9YYG	44,179	K8EJL	2181
W9UVM	38,410	E.N.Y.	
K9DWC	35,089	K2EHC	44,475
W9NLF	33,356	K2PIC	25,830
W9IRH	27,725	W2CJM	15,884
K9GAK	25,992	W2AZO	13,646
K9ISP	14,783	W2TER	13,430
K9HLW	13,429	N.Y.C.-L.I.	
K9ADQ	11,696	K2GTC	24,939
W9YDQ	10,722	W4AHH/2	22,950
K9DJQ	9476	W2GRG	20,215
K9LSN	6173	K2QGS	16,895
K9DCF	4223	K2LQX	12,130
K9MHW	4151	W2DUN	10,180
Indiana		K2CMV	2002
W9YSX	59,457	K2OEG	650
W9ZTD	38,501	N.N.J.	
K9DWK	27,292	W2BRW	28,160
K9ATC	22,418	W2PRE	23,790
K9JRG	22,093	K2JIS	20,216
K9ICG	3177	W2MDF	15,538
K9KBW	2649	K2TUT	12,346
K9HCX	488	W2NTY	9476
Wisconsin		W2MFF	1949
K9ALP	99,420		
W9DYG	75,539		
W9RKP	57,020		
K9ELT	55,071		
W9CHD	47,652		
W9CBE	22,600		

(Continued on page 146)



Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

QST ONLY, OR ARRL?

5800 Bloomingdale Avenue
Richmond 28, Virginia

Editor, *QST*:

Occasionally in conversation with fellow amateurs or in letters published in our *QST* I note the expression "I am discontinuing my subscription to *QST*." What my fellow amateurs are really saying is that "I am withdrawing from our amateur organization." *QST* is our own magazine published by ourselves affiliated together as the ARRL and is a fine benefit of our membership and certainly in itself is worth more than the annual costs. ARRL is you and I and all of the other affiliated amateurs and we control our organization through the use of our nominating and balloting rights and privileges. Our ARRL is operated by and for all of us amateurs and those unaffiliated amateurs may well consider the benefits to us, daily, in our varied ham interests as we are competently represented in our activities by an efficient staff. In their own selfish interests all amateurs should band together and affiliate in our ARRL for the protection, promotion and benefit of our ham-activities. Participation in the organized activities of local radio clubs is also most desirable. The more who are members the greater the benefits to us each and as a group. Our ARRL is not a commercial organization interested in profits as such but is a non-profit service organization to the amateur.

— James R. L. Fitzgerald, jr., K4OJE

TNX

KM6BI, Airbarson Road
Midway Detachment
Navy 3080 F.P.O.
San Francisco, California

Editor, *QST*:

I would like to express my sincerest gratitude to all amateurs the world over . . . to the wonderful guys who have stayed up late, gotten up early, missed their own appointments so that we here on Midway can talk to our loved ones . . . to all those who magically made QRM disappear where there wasn't a "hole" to be found.

You can't realize how very much it means to us. Not just here, but on Kwaj, Guam, Okie, and Adak just to name a few. During the war everyone knew the boys were away on all those little rocks in the Pacific. Now that the war is over, not many realize that there are still men keeping these stations in wartime readiness, thousands of us separated from those we love, usually for more than a year.

Even with the wonderful recreation, life here is at best boring. The major morale booster is that "ham shack." You should see the joy and happiness it brings a man when he can talk to "Mom," or perhaps his wife or sweetheart. I just can't describe it. I can just say, "thank you all ever so much for all of us." . . .

— George H. Morton, W4HUP

TEN KW. AND CHOICE BANDS

5080 Leebel Road
East Petersburg, Pa.

Editor, *QST*:

The article "Russia's Electronic 'Iron Curtain'" was excellent. And this article brings up a number of points I think the League should pursue.

First, the ham bands represent a band of frequencies set aside for the use of the individual public. Any individual in the past, now, and we hope in the future, is free to use these bands by the simple expedient of taking an FCC examination to prove their competence in radio laws, theory, techniques, and operation. As such, the ham bands represent the property of 170 million potential licensees — not just the

170,000 that some would have others believe. What other service can claim this number of potential operators? And because of this fact the width of the ham bands should be increased — not decreased.

Second, since the ham bands are available to the individual public, these bands should be choice bands, i.e., they should allow the best communication, distance and quality-wise, for the least investment.

Third, since interference is now evident on our present bands, it is desirable that our peak input power limitations be raised — at least on the 80- and 40-meter bands — to something at least in the order of ten kilowatts. This would appear reasonable considering today's equipment, techniques, practices, and the general rise in the technical level of the average amateur.

I'd be interested in hearing what others have to say.

— Fred Hammersand, W3SUR

BUILDER OR USER?

Box 485, Linfield College
McMinnville, Oregon

Editor, *QST*:

Among a million other ways to classify hams, there is the distinction between the builder and the operator. This distinction is a basic one found in hot rodding, fly fishing or any other hobby. It is so basic, in fact, that so far as I know, it is always overlooked in polls of the ranks of hamdom. I would like to know which faction prevails in number. Does anyone know?

— Ed G. Dolan, K7AAW

AN OMEN?

5724 Nineteenth Street, North
Arlington 5, Virginia

Editor, *QST*:

. . . The other afternoon I attended the AFCEA convention at the Sheraton-Park hotel in Washington. In the lobby the Navy had set up a handsome and imposing ham station with two complete positions.

There wasn't a key in sight.

Is this perhaps relevant?

— John A. Morriacy, W4HEL

COMMON COURTESY

504 West Second Street
Roswell, New Mexico

Editor, *QST*:

I want to harp a little on a subject that is a big gripe with all in the so-called "rare" western states who work on 50 Mc. — the nuisance of having midwesterners pile up on us when we try to work through them for a needed double-hop contact.

For example, I need Delaware and Vermont for 50-Mc. WAS. If I call "CQ Delaware" anywhere from 25 to 50 W8s, W9s and W0s will pile on my frequency and start calling me. What chance have I to pick out a Delaware station who might be calling, if I have to listen to that many different fellows? Common courtesy should forbid the answering of directional CQs by stations in other areas; at the very least, these fellows could give the caller a minute or so to look for the state or area he mentioned.

Whether he has five, 25, or 45 states worked seems to make little difference to the average 6-meter man; when he hears a hard-to-get state he feels that his plight is desperate enough to warrant his violation of every rule of courtesy. About a year ago I was trying to get through to WIHOY, who had needed only New Mexico for the 50-Mc. WAS for a long time. So many W8s and W9s piled on us that I could

(Continued on page 150)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Communications Ass't.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

RACES Frequencies Extended. Do you follow WIAW radio bulletins? If so, you will have heard in early June (by OBS 705) that FCC amended the amateur rules, effective July first to make certain additional non-exclusive frequencies available for the Radio Amateur Civil Emergency Service. For just what frequencies are earmarked for RACES uses consult the full listing of RACES frequencies in the latest-revised operating booklet or *License Manual*. The subject is covered also in *Happenings*, this *QST*. We mention this matter to forestall some questions from readers hearing RACES groups or scheduled tests in the 7103-7125 kc. (new) or other expanded or new band segments; there are some 6 kc. ones in 7, 14 and 21 Mc. The text of the docket (Feb. *QST*) gives more details but we suggest that amateurs not completely familiar

with the purpose, background and operation of this amateur service, note the editorial discussion, page 9, April '59 *QST*. The earmarking of these additional frequencies for RACES, after certain limitations in the earlier pattern became apparent, should enable those amateurs supporting RACES plans to do a better job in the event of need. RACES operators seek your understanding of their work. Also, your local AREC and RACES groups invite your enlistment in the challenging subject of planning and self-training to do useful public service things with our amateur communication.

What's for Novice and Technician Licensees? A current letter to the writer recognizes the popular appeal for new licensees in so many working for their ARRL CP certifications. These start as low as 10 w.p.m. and there are practice transmissions still slower. Also expressed was the fun in acquiring RCC (Rag Chewer's Club) accreditation and the pleasure as each card arrives piling up the evidence to use for a Worked All States ARRL (WAS) award. You can go places with *all* these *just* as soon as on the air with that precious first FCC ticket! But the letter concluded, posing the question, "What *more* now to work for?!"

Of course our advice, if you aim to get the most there is from amateur radio, is to keep headed toward that General Class amateur ticket, at all costs. One must first develop some know-how and his code, so he has the finest tools to go after every communication goal the book has to offer. Without the privilege of working all bands you are missing a lot. As for what-to-work-for, there are ample goals. If you don't believe us, order up a copy of W3RPG's *Directory of Certificates and Awards* (\$2 postpaid, in U.S.A. and Canada from Bill Clark, 8 Frances Ave., Harrisburg, Penna.). This gives rules for some 200 or more certificates.¹ There's a certificate for about every kind of thing amateur ingenuity can dream up, from working five members of the Jayhawk club, or six members of a net to working 100 different cities in Japan.

OES Appointment Open to Novice and Techs. Eligibility for SCM appointments in many categories is properly deferred until operators have won their full scale amateur privileges. However, the *Official Experimental Station* post

A.R.R.L. ACTIVITIES CALENDAR

July 25-26: CD Party (phone)
Aug. 5: CP Qualifying Run — W6OWP
Aug. 21: CP Qualifying Run — WIAW
Sept. 3: CP Qualifying Run — W6OWP
Sept. 16: Frequency Measuring Test
Sept. 19-20: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — WIAW
Oct. 7: CP Qualifying Run — W6OWP
Oct. 10-11: Simulated Emergency Test
Oct. 17-18: CD Party (c.w.)
Oct. 20: CP Qualifying Run — WIAW
Oct. 24-25: CD Party (phone)
Nov. 5: CP Qualifying Run — W6OWP
Nov. 7-8, 14-15: Sweepstakes Contest
Nov. 18: CP Qualifying Run — WIAW
Dec. 2: CP Qualifying Run — W6OWP
Dec. 17: CP Qualifying Run — WIAW

OTHER ACTIVITIES

Details on these contests will appear in future *QSTs*.

Sept. 5-6: LABRE C.W. DX Contest.
Sept. 12-13: LABRE Phone DX Contest.
Sept. 19-20: Scandinavian C.W. Activity Contest.
Sept. 19-20: Pennsylvania QSO Party.
Sept. 26-27: VE/W Contest.
Sept. 26-27: Scandinavian Phone Activity Contest.
Oct. 3-4: VK/ZL Phone DX Contest.
Oct. 10-11: VK/ZL C.W. DX Contest.
Nov. 21-28: RSGB 21/28 Mc. Telephony Contest.

¹ Numerous listings are also given in the *QST* articles: Operating Achievement Awards, July '57 *QST*, and More Awards, Sept. '58 *QST*.

is one in the reach of both the Novice and the Technician Class operator. It gives recognition to the member who holds appointment and also furthers v.h.f. ARRL organization. You have to be a worker in a band or bands at 50 Mc. or above and show consistent operating interest and reports monthly to your SCM from whom this appointment should be sought, though. Each SCM's address is given on page six of *QST*; get OES application forms from either your SCM or Hq. There are getting to be more and more active OES who are Novice and Tech. Class operators and receive our quarterly CD bulletins and special information sent by ARRL to OES from time to time.

Expanded Emphasis in OES Work. With some pride the League notes steady increases in the number of OES. We recorded an 11% increase in '57 with a 14.4% further growth just last year. The operating booklet lists special objectives (for OES). These include monthly reports on results and propagation, the adherence to high operating ethics and equipment techniques, and a dedication to developing communications systems. In connection with this latter ARRL proposes that OES receive more credit for organized communications services, if and as rendered. We find OES already good supporters of the growing number of v.h.f. nets. From this point we want our numbers and service, including Public Service, to continue to increase to the credit of OES and Amateur Radio. The current up dating of *Operating an Amateur Radio Station*, amending earlier statements in departmental rules spell out this clarification or expanded emphasis in OES Appointment by including the following:

To earn or maintain appointment, OES may also exemplify and demonstrate the capabilities of v.h.f. section nets for rendering communications service to the public and amateur radio. When handling traffic, standard ARRL procedure and message form will be followed and contacts maintained for liaison with NTS to assist in the overall nationally-integrated traffic system, as feasible.

The Amateur Radio Pace, Hobby or Mania? To get the most from one's Amateur Radio and yet to remain balanced is the essence of one of the points of our Amateur's Code! John Turner, W9GDI, in *The Oscillator*, of the Tri-Town Radio Amateurs Club, states the case neatly in a recent bulletin and we think a good many hams will agree. . . . He says,

"Since the war amateur radio, like everything else, has suffered the speed-up. Hams don't have time to learn much theory or construction. They get a license and drop into the nearest radio supply house for the latest gear. Some of these places will even include instruction in what switch to throw! Once the station is assembled, the high pressure operating starts. Don't make friends, don't rag chew, just rack up countries, points in SS, or whatever your ambition is, and don't worry about operating ethics . . . Every other phase of our lives gets more and more regimented. Must our hobby suffer this same fate? It's my curse to have been bitten by the DX bug. New countries have been terribly important. Lately, however, I find that I can tune across a DX band, listening to the boys exchange RST's and move to 80 meters to chew the rag! When the day dawns that I can hear a new one, and still move to 80, then, I know that I'll have the mania cured, the monkey off my back, and the fun will be back in ham radio for me."

There you have it. The obvious conclusion? To take our DX, traffic, contests etc. in reasonable doses. Work toward objective results, but don't sacrifice family, friends or health in the doing. This is quite largely a matter of learning to make decisions. We shouldn't permit all our station to be factory stuff either . . . that know-how from some do-it-yourself is worth a great deal. As for our ARRL recording of results in traffic, emergency work, nets and all fields, that is to establish values for the institution, as well as recognition for the individual. But the certifications of ARRL and the hobby while providing incentive, should leave us as individuals the master, not the slave. To summarize, Lesson One in any hobby, or the use of one's leisure time should be the exercise of self-discipline and control. W9GDI's remarks indicate his hobby well under control, and that he is capable of objectives even besides the DXCC. —F. E. H.

WIAW OPERATING NOTE

The complete summer schedule of the ARRL Headquarters station appears on p. 89 of last month's *QST*. See that issue for information on when to visit WIAW, have a QSO, or copy the various bulletin transmissions that are made daily on phone and c.w.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made Aug. 21 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted Aug. 5 at 2100 PDST on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from WIAW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your list, hook up your own key and audio oscillator and attempt to send in step with WIAW.

Date	Subject of Practice Text from June <i>QST</i>
Aug. 3:	<i>A Look Back and Ahead at PRP</i> , p. 48
Aug. 7:	<i>Publicity Corner</i> . . . p. 51
Aug. 11:	<i>Sceptical Results</i> , p. 54
Aug. 13:	<i>Mobility in Mexico</i> , p. 66
Aug. 17:	<i>The Bowdoin's Last Voyage</i> , p. 73
Aug. 20:	<i>Nonstop Solo Flight</i> , p. 74
Aug. 26:	<i>Are Your Public Relations Showing?</i> , p. 53
Aug. 31:	<i>Mobile S.S.B. Transceiver</i> , p. 11

FIELD DAY NOTE

The Communications Dept. is on the lookout for action-packed 1959 ARRL Field Day photos. Got yours in yet? High claimed scores coming up in October *QST*.



We have just completed a statistical survey of AREC reporting records for the year 1958. Why so late? Well, can we help it if ECs don't get their reports in until the middle of June of the following year? We initially made a year-end survey so that some data could be included in our annual report to the Board of Directors; but subsequent to that, more than thirty additional reports were received, so we had to do it all over again. We're glad we did, because it upped almost all of our previous figures.

On the basis of these reports (376 sent in altogether, but only 368 were useful in the survey), we can make an educated estimate that we have slightly over 40,000 AREC members in our emergency corps. About one in six of these can operate his fixed station on emergency power. The favorite band is (you guessed it!) 75 meter phone, but most can also operate on other bands, 80 meters through 10 meters. The ratio of mobiles remains about one in three, with ten meters still the favorite mobile band. Six meters is gaining fast in popularity, both for fixed and mobile uses.

We find that the number of AREC units dedicated to a single agency is about the same as in 1947, but that dedication to civil defense has declined while dedication to Red Cross has increased. The percentage of AREC members signed up in RACES also seems to have decreased about 10%. As a further indication of this trend, fewer ECs reported identical AREC-RACES groups (although more overlapping is indicated), more AREC-RACES groups are entirely separate, there is more antagonism, and fewer ECs are identical with ROS.

Naturally, we're happy with the continued uptrend in the AREC, but the apparent decline in RACES participation is not good. The AREC has been our emergency organization for 25 years, and as such it is the natural implementing vehicle for RACES. RACES is our job. We're aware of the difficulties and obstacles involved as much as you are (maybe more), but if we leave the implementation of RACES to non-AREC amateurs we're not doing either ourselves or the nation a service. So keep after it. Don't let it languish.

The above data are estimates based on reports received from 368 ECs, about 20% of the total. This percentage of return on our annual questionnaire seems to remain fairly constant from year to year, and by statistical standards may be considered a fairly good return. But we're not satisfied with it. Of course we can't hope for anything approaching 100%, but we see no reason why an EC can't take the trouble to send in a questionnaire just once a year to help make our estimates more accurate; we see no reason why we cannot attain a 50% figure or better.

In 1958, there were 10 sections from which no EC reports were received. Eight reports (out of 376) contained no data

usable in the analysis. The section having the most ECs is Eastern Mass., with 103. This section also submitted the greatest number of EC annual reports (30), but not the highest percentage. Kentucky ranked highest in this respect, 10 of its 11 ECs submitting reports (90.9%). Eastern Florida deserves special mention for an outstanding reporting record among sections with 25 or more ECs, 21 of its 51 ECs reporting (41.2%).

As we have often said, reporting isn't everything, and the statistical best is not always the actual best. But you'd be surprised how often the statistics bear out actual performance. Besides, they're all we have to go on. We think one of the big reasons ECs don't report is that they feel they have nothing to report, and quite often this puts the burden back on you, the AREC member. If you accept this burden, and give your EC something to talk about, he'll be more ready to make his reports. Then, maybe, we can reach that 50% figure. Shall we have a go at it, fellows?

While monitoring 50.4 Mc. on May 7, K6PZM heard K6QQN calling "CQ emergency." Answering the call, he was informed that the caller was mobile on the Harbor Freeway in Los Angeles and had come upon an accident in which there appeared to be an injury. No police were about, and traffic was blocked for some distance. K6PZM, acting on information from K6QQN, called the Highway Patrol and gave them all the details, whereupon necessary equipment was immediately dispatched to the scene. — K6PZM via W6JQB.

Close cooperation and quick thinking on the part of three amateurs brought aid to a victim of a hit-and-run driver on the morning of May 18, in Chicago. K9LTC was driving home when he was flagged down by a man who told him that someone was lying in the road, severely cut and bleeding. K9LTC sent out a QRRR, which was heard by K9PBN, but contact was difficult so K9KLU relayed the message. Police were notified and an ambulance was dispatched to the scene within minutes.

Still another highway accident, this one in Middle Village, N. Y., was reported by K2VBH on May 27, when a car hit a pole and a man and girl were injured. K2VBH immediately called "CQ Emergency" on six meters. The message was received by W2AJC, who notified police in Jamaica and radio cars and an ambulance were sent on the way. While waiting for their arrival, K2VBH, who had been following the car when the accident occurred, gave complete details of the accident and apparent extent of injury.

Four inches of rain fell in Cleveland, Ohio, on June 1, washing out sewers, roads, business establishments, homes, and precipitating a communications emergency. The American Red Cross called out the Mayham Amateur Radio Club under the leadership of W8OKE. Using six meter gear, a base station was set up at Red Cross Headquarters under K8DQB. Other stations were established at University Circle (K8NNA) and at Shaker Heights City Hall (K8EXL and K8ISN). Mobile units searched for flood victims and brought aid to those in need of food, clothing, shelter and medical attention. Mobiles participating were W8s OKE NMY, K8s JDJ JDQ GQL and NYZ. This was the first time the Mayhams were called out by Red Cross, and they performed splendidly. — K8JDQ.

An earthquake off Siberia alerted the Hawaiian island of Kauai to possible tidal wave activity on May 4. Three amateur stations were linked with the territory-wide c.d. net and were ready to handle any emergency communications, but the disturbance did not materialize and the alert was cancelled at 0256. Amateurs standing by were KH6s ARL SN ASX CNP CNC and OEL.

A surprise practice alert by the Red Cross on May 4 in St. Clair County, Mich., found the amateur contingent ready. The problem was a make-believe tornado. W8FWQ received the envelope containing instructions and immediately got in touch with W8QFQ, the EC, then put the Red Cross amateur radio station on the air. Members of the corps were called by landline and radio, and within a short time a mobile was speeding toward the scene of the mock disaster. Other mobiles took up strategic positions to relay messages. Within a short time the county AREC had seven fixed stations and six mobiles organized and operating. The

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

alert was termed a success by the chapter chairman.

Cuyahoga County, Ohio, AREC, reports two April activities. The first was a full scale dress rehearsal of the AREC's "Severe Weather Warning System" on April 1. A total of 69 amateurs participated through eight separate networks covering 24 different communities. In spite of deliberate efforts to disrupt the project with simulated power failures shutting down key stations, the exercise was very successful.

The second activity was participation in a parade to celebrate the arrival of the first foreign vessel in Cleveland through the newly-opened St. Lawrence Seaway. A hand-carried unit was used on the dock as the boat came in, keeping the waiting parade informed as to the progress of the welcoming committee and coordinating the entire effort. Three mobiles worked in the parade itself, furnishing communications for the officials. The entire operation was carried out under the greatest difficulties in a cold rain driven by a 60-mile-per-hour gale. Five amateurs took part. — WSAEC, EC Cuyahoga County, Ohio.

The Mt. Pleasant (Mich.) Amateur Radio Club conducted an emergency communications drill on April 23. The simulated disaster was a tornado which struck the northwest section of the city, knocking out public utilities and communications. Twenty-two members participated, with portable units at c.d. headquarters, the hospital, Red Cross headquarters and other strategic locations, in addition to mobiles. Said the Red Cross disaster chairman: "Without the assistance of the Mt. Pleasant Amateur Radio Club, this area could conceivably be cut off from communications with the outside."

On April 28 and April 30, 23 amateur stations located at Veterans Hospitals throughout the nation conducted test schedules with each other, at the request of the U. S. Veterans Administration, "to test amateur radio facilities" between various Veterans Hospitals to work out a setup for use in case of disaster. Schedules were kept on 75, 40 and 20 meter phone, frequency band used depending on the distance to be covered. Most of these stations are equipped with emergency powered equipment, some self-owned, some government-owned. The test schedules were, generally speaking, successful, furnishing data from which a regular communications network could be set up. — K5BLW.

Twenty-three SEC reports were filed for April, representing 7116 AREC members in those sections. This is two lower than the 25 received for April of last year, but a slight increase in number of AREC members represented. Kansas SEC reported for the first time this year. Other sections reporting: Ore., NYC-LI, Colo., Wash., W. Mass., N. Dak., San Joaquin Valley, N. Mex., E. Fla., E. Bay, W. N. Y., Mich., W. Va., Ala., Wyo., Wis., S. Texas, Vt., Santa Clara Valley, Maritime, Mo., Minn.

RACES News

Effective July 1, we have some new RACES frequencies. This is in accordance with FCC Docket 12719, responsive to an original proposal by the U. S. Civil Defense Amateur Radio Alliance. The new segments will give RACES some much-needed additional segments of the amateur bands on 75, 80, 40, 20 and 15 meters. The provisions in detail are quite complicated and we urge all concerned to read carefully the proposals detailed starting on page 164, February 1959 QST. The adopted language was not changed in FCC's finalization of this amendment.

In effect, and without going into the restrictions and provisos affecting the new segments, RACES now has operating privileges in the following segments, in addition to those previously available: 3510-3550 kc.; 3984-3990 kc.; 7097-7125 kc.; 7245-7255 kc.; 14,047-14,053 kc.; 14,220-14,230 kc.; 21,047-21,053 kc.

Note that the new segments encompass the ARRL National Calling and Emergency Frequencies on 40 phone and c.w., on 20 phone and c.w., and on 15 c.w. Note also that the greatest expansion has been made on the c.w. bands, as befitting the long-range characteristics of these bands and their expected use for point-to-point circuits.



At a ceremony in the Communications Room of the Louisiana State Civil Defense Agency on June 10, W5CZ (left) was presented with a special Certificate of Appreciation by C. D. Director Major General R. F. Hufft (right) for outstanding work in organizing and equipping the statewide mobile c.d. network on 147.3 Mc.

There was much misunderstanding concerning the purpose of this proposal when it first came out, and many of the comments expressing opposition were based on the supposition that these frequencies would be exclusively RACES. Not so. Regular amateur radio has lost nothing. RACES has gained something. The total result is a gain for the amateur service. We hope all you RACES people will plan to make maximum use of these new segments as soon as possible.

Many of you will remember that during Operation Alert on April 17-18 we sent out a bulletin to ECs requesting that amateurs report the results of the CONELRAD test direct to OCBM in Battle Creek, Mich., — and we enclosed cards for this purpose. The request was late in reaching us, but we crammed it into the OPAL bulletin which was already late in hitting the mails, and as a result the whole thing arrived anywhere from a day to a week late at its destination.

Despite this, OCBM reports that over 800 cards reporting CONELRAD results were received from amateurs (we had estimated they would receive between 400 and 500) and that they were assisting materially in evaluating the test on a national level. They expressed amazement that we could produce such results on such short notice. We're a little amazed ourselves. Thanks for your cooperation, fellows. It was a good showing.

Milwaukee news: The Southeastern Wisconsin Two-Meter Emergency Net, covering the Milwaukee Metropolitan Target Area, has not missed a session since it was started in 1946. The net operates both on RACES frequency of 145.65 Mc, and its regular net frequency of 145.665 Mc. An average of 25 stations report in each Monday night, and a link with the Chicago Watch Dog net is maintained on two meters.

At the June meeting of the AREC in Milwaukee, W9GIR gave a talk on portable two-meter boms useful to work with low-power c.d. two-meter portable units, W9TQ lectured on and demonstrated the principles of RTTY.

A successful drill of the Lakeshore Emergency Net was conducted on May 18, with W9LIT of the Milwaukee C.D. Control Center as NCS. The drill was held on 29.5 Mc, at 1930. W9VD monitored from a critical receiving location and later gave a complete report on signal strengths of stations in the Milwaukee area. Inasmuch as the band was "open" to skip, some QRM was experienced from distant stations. — K9KJT.

Operation Alert in the Canal Zone took place on May 26, with the new c.d. radio section in control. Communication between the main control center at Balboa Heights and alternate control in Coco Solo was on 40 meters, local communication on 10 meters. Conditions made it possible for 10-meter signals to be read consistently at distances up to 60 miles. All amateurs reported promptly and were ready for instructions immediately after the all clear sounded. The operation assumed that the Atlantic area of the Canal Zone was completely devastated. Mobile units of the Pacific Sector were dispatched to the Atlantic Sector and took part

in the completion of the operation. — *KZ5RV, SCM Canal Zone.*

Area 7 of Indiana C.D. has recently acquired 21 mobile units from surplus. The units were originally operated on 34 Mc. and will be converted to six meters. Within the area, Vermillion County now has two bases and four mobiles, Parke County has a base and five mobiles, and Vigo County has a base for its trailer and several mobiles. It has been decided to write an Area RACES Plan instead of individual county plans so that those amateurs in counties where there is no active c.d. can qualify for RACES. A c.d. net on six meters is also being started to provide practice in c.d. traffic handling. Area 7 of Indiana RACES expects, slowly but surely, to be one of the best organized in the state. — *W9IHO.*

On May 14, Washtenaw County (Mich.) made a test run evacuating school children from four eastern townships. Altogether, 396 pupils were involved. Five convoys were formed, with a radio car in each convoy, and mobile units were asked to make five reports going and coming to and from the evacuation area. All reports were received except from Car 5, which was heard from only twice. Fifteen amateurs were involved in this exercise.

ELECTION NOTICE

(To all ARRL members residing in the Section listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL, [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the
..... ARRL Section of the
Division, hereby nominate
as candidate the Section Communications Manager for this
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	Closing Date	SCM	Present Term Ends
Yukon*	Aug. 11, 1959	W. R. Williamson	Mar. 17, 1949
West Indies	Aug. 11, 1959	William Werner	Aug. 10, 1958
Mississippi	Aug. 11, 1959	J. A. Houston, Jr.	May 29, 1959
Saskatchewan*	Aug. 11, 1959	Lionel O'Byrne	June 10, 1959
Manitoba*	Aug. 11, 1959	James A. Elliott	Aug. 9, 1959
San Joaquin Valley	Aug. 11, 1959	Ralph Saroyan	Oct. 10, 1959
San Diego	Aug. 11, 1959	Don Stanifor	Oct. 15, 1959
Utah	Aug. 11, 1959	Thomas H. Miller	Oct. 28, 1959
Western Massachusetts	Aug. 11, 1959	John F. Lindholm	Resigned

Alabama	Oct. 10, 1959	Clarke A. Simms, Jr.	Dec. 14, 1959
Quebec*	Oct. 10, 1959	C. W. Skarstedt	Dec. 15, 1959
Western Florida	Oct. 10, 1959	Frank M. Butler, Jr.	Dec. 15, 1959
Illinois	Oct. 10, 1959	Edmond A. Metzger	Dec. 15, 1959

*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

British Columbia	Peter M. McIntyre, VE7JT	April 10, 1959
Oklahoma	Adrian V. Rea, W5DRZ	Aug. 9, 1959
San Francisco	Leonard R. Gerald, K6ANP	Aug. 14, 1959
Southern New Jersey	Herbert C. Brooks, K2BQ3	Aug. 28, 1959

In the Iowa Section of the Midwest Division, Mr. Russell B. Marquis, W8BDR, and Mr. Jerry L. VerDuft, K8C'LS, were nominated. Mr. Marquis received 204 votes and Mr. VerDuft received 167 votes. Mr. Marquis' term of office began June 16, 1959.

In the South Dakota Section of the Dakota Division, Mr. J. W. Sikorski, W0RRN, and Mr. Lester R. Lauritzen, W8STC, were nominated. Mr. Sikorski received 92 votes and Mr. Lauritzen received 58 votes. Mr. Sikorski's term of office began July 2, 1959.

In the New York City and Long Island Section of the Hudson Division, Mr. Harry J. Dannels, W2TUK, and Mr. George V. Cooke, Jr., W20BU, were nominated. Mr. Dannels received 654 votes and Mr. Cooke received 438 votes. Mr. Dannels' term of office will begin July 31, 1959.

NDW-K6USN SCHEDULES

Tape-sent transmissions can be heard from the Naval Reserve Radio School, Twelfth Naval District, at San Francisco, on the following schedules:

Call	Kc.	Days	P/ST Time	W.p.m. Speed
NDW	4045	Mon.-Thur.	1930-2100	8
			2100-2130	10
			2130-2200	12
K6USN	1978/3590/	Mon.-Thur.	1830-1930	5-45
	7136			(3 min. steps)
K6USN	1978/3590/	Fri.	1900-2030	20-45
	7136			(13 min. steps)

W6ONK submits the above information courtesy of RMC Don Johnson, USNR, and says the practice is mostly plain language text, its purpose to assist not only new men but all amateurs in becoming faster, better operators.

TRAFFIC TOPICS

The Traffic Session at the National ARRL Convention in Galveston, Texas, in June, was an after-thought. It seems apparent that the convention committee never gave it a thought, or else didn't think it would attract enough interest to be worth while. At it turned out, we had one (a Traffic Session, that is), for which a small mimeographed addendum was stuck into the regular printed convention program. How many showed up? Oh, 25 or 30 out of a total convention attendance of 1500 or so. It was a good meeting, and we all enjoyed ourselves; but with a little more advance planning and publicity it could have been a lot bigger.

We're not blaming the convention committee. If anybody is to blame, it is ourselves. We're inclined to be a little too quiet, too passive, in our specialty. A lot of us, we suspect, don't attend conventions because if we do, who's going to handle the traffic? So it hits us with no particular surprise, even though with some dismay, when we do go to a convention and find no traffic meeting scheduled—or one running concurrently with six other popular amateur operating activity specialties.

We have been to some conventions which have had real rip-snorting traffic sessions. Mostly, these were the result of an active traffic man on the convention committee, who hammered and hammered until he got the spot he wanted at the time he wanted it, then worked up a really interesting program designed to attract casual amateurs as well as the traffic man. Even so, some potential attendance is lost, inevitably, to other convention doings at the same time.

We're not suggesting that you make yourselves obnoxious with convention chairmen, pore fellers. But it is a fact that the average convention or hamfest is a local

affair — locally sponsored, locally run, and to a great extent locally attended. As a result, the activities planned will be based pretty much on local tastes, this regardless of whether the convention is national, divisional or state. If we traffic men want to talk traffic at conventions, we have to find some way of indicating to the committee that this is not only desirable, but also that it will be popular. And it won't be popular unless we traffic men are on hand to make it so.

So, at the risk of depleting some of our traffic nets at convention times, we urge all and sundry to attend conventions and, at those conventions, attend the traffic meeting. Make those traffic meetings overflow into standing room and around the outside of the door. We also don't want to detract from attendance at other meetings, but if something else is going on at the same time, give some consideration to attending the traffic meeting instead. We need you.

August 1 is the effective date for net re-registration. Use

CD-85, or wait for full details on how to register (Sept. QST).

Net Reports. Early Bird Transcon Net had 31 sessions, handled 447 messages. The 7290 Traffic Net had 42 sessions, 1196 check-ins, handled 458 messages. Hudson Traffic Net conducted 31 sessions, had 267 check-ins, handled 199 messages. Transcontinental Phone Net reports 31 sessions and a traffic count of 2235. Sundown Traffic Net had 28 sessions, 125 check-ins, 42 messages. North Texas-Oklahoma Net reports 764 check-ins, handled 161 messages. Mike Farad Emergency and Traffic Net reports 21 sessions, traffic total of 255.

National Traffic System. During the month of August, the writer of this column will be undertaking a somewhat extensive trip, starting early in the month. This means that there will be no one here to do the necessary with all the NTS reports received between the 10th, when we take off, and the

DX CENTURY CLUB AWARDS

HONOR ROLL			
W1FH.....294	W8BRA.....289	W3KT.....287	W4OPM.....203
W6AM.....294	W3JNN.....289	W2BXA.....287	W9TKV.....202
ZL2GX.....293	W5ASG.....289	W6MX.....286	W4UXL.....201
W8HGW.....293	G3AAM.....289	W3BES.....286	W5UMR.....201
PY2CK.....292	G2PL.....289	W8DMD.....286	W1PFA.....200
W3GHD.....292	W2HLQ.....289	W8HBP.....286	W1TSS.....200
KV4AA.....291	ZL1HY.....289	W6ADP.....286	W6NMQ.....200
W9NDA.....291	W6CTQ.....288	W6EBG.....286	W5HCR.....200
W9JIN.....290	W6DZZ.....288	W7AMX.....286	G13IVJ.....200
W8SYV.....290	W9YFV.....287	W7GUV.....285	W9TKV.....198
W2AGW.....290	W1ME.....287	W5ADZ.....285	W6NMQ.....196
W6ENV.....290	W9RRL.....287	W4TMM.....285	J1AAA.....196
	W6GEF.....287		W3BQA.....194
Radiotelephone			
PY2CK.....292	VQ4ERR.....282	ZL1HY.....278	W4JRU.....190
W8GZ.....284	W8HAR.....280	W8KML.....274	W4NFW.....190
ZS6HW.....283	W3JNN.....280	W6AM.....273	W4UKA.....190
W8HGW.....283	W9RRL.....279	W6YY.....274	YV5BZ.....190
W1FH.....282	W9NDA.....272		W2ROM.....188
			W9HQF.....185
			W6RGQ.....184
			W6CIS.....183
			W71AA.....183
			W0LBB.....183
			W1OOS.....181
			K5BGT.....181
			W7OCL.....181
			HP1BR.....181
			W2CGJ.....180
			W6OUN.....180
			W8MWL.....180
			CN8AC.....180
			K9ECO.....180
			KL7PIV.....176
			DL9RK.....173
			JU.....173
			K4DRO.....171
			W6WTH.....171
			W2BWK.....170
			W2VYX.....170
			W6GVM.....253
			T2RC.....251
			W9WHM.....250
			W3ECR.....233
			W9YSN.....232
			W3DHM.....231
			PY4KL.....230
			CE3HL.....203
			CN2AX.....203
			W1GOT.....200
			ON4DH.....200
			W5MMK.....194
			W8NGO.....190
			K4BRQ.....185
			W08YK.....181
			W1GKK.....180
			W6QOG.....180
			W21LV.....178
			W3EYV.....170
			W3ZAO.....220
			W6HBP.....220
			W9TQL.....220
			SM5WI.....220
			K4BVQ.....219
			V29YV.....211
			11NK.....210
			SM5AHK.....210
			VE3JZ.....210
			VE7MD.....210
			CE3HL.....206
			W11JB.....206
			W8EYE.....205
			W9FV.....204
			W7PHO.....252
			W9AIW.....251
			W2BXA.....249
			W4DQH.....245
			W5BGP.....241
			W7PHO.....252
			W9AIW.....251
			W5BRR.....170
			W8JRU.....170
			W9OAJ.....170
			K4PYI.....170
			OK1JX.....170
			VE6JR.....170
			W8JXY.....168
			W8ELL.....164
			W2PTD.....163
			W2PTD.....163
			G3BYM.....163
			KH6BLX.....163
			W4VCB/3.....162
			W8LY.....162
			W2BYU.....161
			J3JZ.....161
			W1OQA.....160
			W8RX.....160
			K6HJL.....160
			W7WH.....160
			W8AJH.....160
			K9GXR.....160
			V3EEL.....160
			OH2YV.....159
			W3KA.....157
			K4GSS.....153
			VE5VL.....153
			K2EWH.....152
			J0V1L.....151
			W4ZMC.....151
			VE3BBS.....151
			K6GLC.....150
			W8TTN.....150
			W4BO.....150
			HB9IM.....150
			VE7EH.....150
			F8SK.....149
			K2JFV.....149
			K2QQQ.....144
			W8TQY.....144
			E19Q.....144
			W4YR.....143
			W4SXE.....142
			W3NKM.....170
			W9QGI.....164
			W5MFE.....161
			W6NJU.....157
			ZL4BO.....155
			K2JFV.....151
			W5UMR.....151
			PA0ZD.....152
			W4BRO.....150
			E47EM.....150
			W9UZZ.....146
			OE2YL.....144
			C08JK.....143
			K2QQQ.....142
			F8SK.....142
			K2JGQ.....142
			W1BAN.....140
			W1JHY.....140
			W4VCH/3.....140
			W5WJQ.....140
			K4JQR.....110
			W8HOY.....140
			W4YQB.....135
			W4ZMC.....135
			W6WTH.....135
			K2JFV.....131
			W5UMR.....131
			EA6AR.....130
			PY4EM.....130
			W9YRO.....129
			W8YX.....128
			W2TF.....125
			F8TRT.....124
			CT1HF.....122
			W1ZSU.....120
			KL7PIV.....115
			W3SW.....113
			W6WJL.....113
			W4VCH/3.....111
			K4JQR.....110

From May 1, to June 1, 1959 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

PA0BW.....205	PA0NLC.....106	K4HQV.....101
J4JDM.....173	PJ2MC.....106	W4PDP.....101
K6OYE.....132	VQ4FM.....106	UA4IE.....101
E1AAB.....132	W1PFA.....105	W1PFA.....101
W3ZBF.....122	W7YEF.....105	W3LSG.....101
ZL1NG.....122	CX2AM.....105	K4CIA.....100
W4KET.....121	J4JUL.....105	W4KJL.....100
K16FTX.....121	W1EGH.....104	K4PHY.....100
VE5PB.....116	W2OCL.....104	K4SKO.....100
K1CCA.....111	W9AKH.....104	W6FTD.....100
UA6LI.....109	K0BHT.....104	W8QFC.....100
W5CPW.....108	K4KTR.....103	W6CGY.....100
W8SVC.....108	XW8AL.....103	DL7DE.....100
K6IAWJ.....108	W2JWK.....102	KR6JF.....100
G3JFB.....107	K7GIE.....102	OZ7GC.....100
SP6EZ.....107	K8KAE.....102	UA1CK.....100
K2UTC.....106	HA5DH.....102	UF6FB.....100
K5JCC.....106	OK1KKJ.....102	VE3CIO.....100
W8JAH.....106	OK1UY.....102	VE7KX.....100
D4JDN.....106	SM6APE.....102	VO2NA.....100
OH2HW.....106	W1LGE.....101	ZL1AMO.....100
	W2LFL.....101	
Radiotelephone		
G13IVJ.....158	W5JME.....111	E19Q.....101
W2KR.....141	LX1DE.....111	PJ2MC.....101
E1AAB.....124	W1GR.....110	W2CPI.....100
VK3ACN.....123	W0LBB.....110	K2FW.....100
G3BYM.....122	G2TZ.....109	W20TZ.....100
CN8CS.....115	E42CK.....104	W3V8U.....100
K9ALP.....115	ZS6AHW.....104	K4GAL.....100
VK5AB.....114	W3ZBF.....104	ZL4HE.....100
	W4HYH.....101	

ENDORSEMENTS

W6VE.....281	W9RKK.....235	W3ZAO.....220
W2LPE.....280	W3NKM.....233	W6HBP.....220
W5MMK.....273	W5HDS.....233	W9TQL.....220
W7PHO.....272	K4LNM.....232	SM5WI.....220
W3ECR.....270	K0GGL.....232	K4BVQ.....219
W7KTN.....270	K6ENL.....231	V29YV.....211
W9AIW.....270	W6WWQ.....230	11NK.....210
W7AC.....267	W2DSB.....228	SM5AHK.....210
W3GT.....264	W8NAK.....225	VE3JZ.....210
W4LYV.....263	K4GSU.....223	VE7MD.....210
DJ1BZ.....261	W1NLM.....221	CE3HL.....206
OK1FF.....256	W5AWT.....221	W11JB.....206
W4IML.....251	W0BPA.....221	W8EYE.....205
W3PGB.....250	ZL1AH.....221	W9FV.....204
W1BL.....240	W1BGA.....220	W1NHJ.....203
	W2ESO.....220	

U.S.-Canada Area and Continental Leaders

W0ELA.....277	VE3RE.....230	VE7ZM.....272
KL7PL.....202	VE4XO.....180	VE8AV.....195
W5BGP.....251	VE5RU.....185	VO1DX.....211
VE2WW.....240	VE6NX.....241	4X1DK.....276
VE3DIF.....230		ZS6BW.....283

Radiotelephone

KL7AFR.....190	VE5RU.....102
VE1NH.....122	VE7TF.....134
VE2WW.....120	VE7ZM.....244
VE3KF.....224	G2PL.....261
VE4RF.....102	4X1DK.....268

fifteenth, when our copy is normally due. This in turn means that you will have to have your reports in our hands *not later than August 10*.

We know that this is a large order, when so many of you have trouble getting your NCS to report promptly. We mention it here, because we want the NCS to see it, too. When you get this issue of *QST*, it's your signal to get your NCS report to your net manager *pronto*, so he can whomp up his report and ship it right off.

Can do? All nets whose July reports don't get here by August 10th will be left out of October *QST*, but we'll list them in the November issue provided the reports have a received-date stamp not later than Aug. 15. Let's see how good a showing we can make.

May reports:

Net	Ses- sions	Traffic	Rate	Aver- age	Repre- sentation (%)
EAN	29	1510	.725	37.7	98.3
CAN	31	1377	.617	27.4	96.8
PAN	31	1652	.784	53.2	100.00
1RN	31	499	.388	16.1	87.1 ¹
2RN	62	479	.371	7.7	99.4
3RN	62	384	.296	6.2	81.2
4RN	62	621	.303	10.0	63.1
RN5	62	1019	.411	16.4	88.0
RN6	62	1387	.466	22.4	93.2
RN7	62	880	.378	14.2	43.3
8RN	62	251	.154	4.2	85.0
9RN	56	817	.429	14.5	83.9
TEN	62	701	.450	11.3	64.7
ECN	17	46	.135	2.6	70.6 ¹
TWN	30	403	.276	13.4	72.9 ¹
Sections ²	1030	6731		6.5	
TCC Eastern	84 ³	342			
TCC Central					
TCC Pacific	115 ³	1130			
Summary	1751	20229	PAN	10.7	PAN
Record	1466	18192	.909	22.1	100.0

¹ Region Net representation based on one session per night. Others are based on two or more sessions.

² Section nets reporting: NJN (N. J.); GSN (Ga.); CN & CPN (Conn.); Iowa 75 Phone; SCN (So. Calif.); MID (Md.-Del.-D. C.); Beehive (Utah); TLN (Iowa); WSN (Wis.); SDN, S. Dak. 75 Phone, S. Dak. 40 Phone; QKS (Kansas); Early KPN, KPN, KYN, MKPN (Ky.); Gator FMTN, TPTN, FPTN, WFN (Fla.); OQN (Ont.-Que.); WYN (W. Va.); MPN Evening, KMG, MSN, MPN Noon (Minn.); VN (Va.); AENO, AENP, AENP Morning, AENT, AENB (Ala.); BCN (B. C.); QMN (2 Mich. nets).

³ TCC schedules held, not counted as net sessions.

W9DD reports a "slow month" in May, with a few nights when conditions were all but impossible. CAN certificates have been issued to W9DYG, K4VDL and K4KNP. W6PLG has issued PAN certificates to K6CPQ, K6LVR, W7BDU, W7DPW, W7JBV and W0WME. W3UE reports that the status of W. Pa. on 3RN is destined to become worse now that W3LXU will be away much of the summer. Incidentally, we had the pleasure of entertaining Jim (W3LXU) at ARRL HQ early in June. W4SHJ has issued a 4RN certificate to W4PNM, the N. C. RM who put that section back on the map NTS-wise. K6HLR continues to do one of the best jobs of net-managing we have ever seen on RN6; certificates have been issued to K6DMW, K6JSD and W6VLJ. We don't think that there will be any more missing RN7 reports, now that W7QLH is at the helm. W8DSX says that this month's report has no missing sections, the first such in a long time. VE2DR and VE3DCX are doing tremendous jobs on ECN.

Transcontinental Corps. Summer is a rough time for transcontinental relaying. The prospective loss of the 14300-14350 segment, where many TCC schedules were held, isn't going to make it any easier, either. We need to make more use of 21 Mc., and even 28 Mc., as possible alternates to our 7 and 14 Mc. frequencies when skip is too short. Versatility is the thing! It helps to have alternate times and frequencies agreed upon in advance, "just in case." Except in extreme circumstances, there is no reason why contact should be impossible because of propagation conditions. Use the amateur band that is nearest (on the low side) to the m.u.f., and your TCC schedule will seldom fail.

W6EOT is pleased with progress in the Pacific Area. Note the new stations on his roster, below. His latest gim-

mick is a prize for the TCC station each month who comes closest to guessing the total TCC traffic. Naturally, the most active TCC man is going to make the most educated guess.

May reports:

Area	Func- tions	% Successful	Traffic	Out-of-Net Traffic
Eastern	84	91.7	1582	342
Pacific	115	92.2	2243	1130
Summary	199	92.0	3825	1472

The TCC roster: Eastern Area (W3WG, Dir.) — W7s AW NJM, W2VDT, K3s SIL UTV MFF QBW, W3s COK LXU WG, K8JLF, Pacific Area (W6EOT, Dir.) — W5DWB, K8s LVR OJV CPQ HLR GD, W6s EOT HC ELQ, GYH, W6ATB, K7CWW, W7s GMC ZB BDU, W6KQD.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for May traffic:

Call	Ordg.	Recd.	Rel.	Del.	Total
W3CUL	302	1879	1506	329	4016
W2KEB	210	1761	1395	237	3603
W7BA	21	1376	1324	51	2772
W6ZJB	219	1074	952	20	2245
W0BDR	16	981	898	20	1915
W7PCY	19	723	691	28	1441
K2UTV	302	554	527	27	1410
W0LGG	21	364	40	16	1341
W9NZZ	287	511	5	504	1307
W6WPE	5	581	547	33	1166
K6LVR	19	569	548	6	1123
W9IDA	8	551	546	3	1108
K6HLR	42	553	461	26	1082
W8CPH	18	514	464	49	1045
W5RCP	28	451	400	44	930
W0BLI	1	428	424	1	854
W0CPI	3	410	363	47	823
W0LCX	35	383	374	9	801
K9DAC	27	387	380	6	800
W9DYG	20	388	369	17	794
K5MBK	20	387	375	8	790
W7DPW	12	412	320	15	754
W7ZB	6	375	347	21	749
W0OHJ	2	357	341	15	715
K2SIL	3	353	344	10	710
W7DPL	12	347	330	12	701
K0OXS	153	262	268	8	691
W6GYH	122	300	242	12	676
K7CLL	50	309	284	18	661
K1BOS	173	229	192	30	624
W1AWA	17	297	281	16	611
W5CEZ	16	317	244	27	604
W7BDU	1	301	296	4	602
W6RSY	57	279	176	89	601
W6EOT	17	297	248	26	588
W7QLH	11	276	249	17	553
K4VDL	25	252	262	0	539
W1NSM	23	261	232	19	535
K6CPQ	9	276	225	19	529
K0CLS	27	249	234	14	524
W9DD	19	241	61	199	520
K1GEP	43	237	224	13	517
K1CIF	201	161	131	21	514
W7DZX	10	253	219	27	509
Late Reports:					
W4PL (Apr.)	7	412	254	16	689
K6YBV (Apr.)	35	287	214	14	550
K9KBD (Apr.)	35	248	232	7	522

More-Than-One-Operator Stations

Call	Ordg.	Recd.	Rel.	Del.	Total
W6YDK	1221	671	501	170	2563
K5WSP	102	1142	1122	20	2386
K6MCA	110	1066	969	97	2242
W4PFC	19	509	485	24	1037
K5LSA	122	365	349	13	849
Late Reports:					
K6MCA (Apr.)	132	817	801	16	1766
W6ZJB (Apr.)	200	717	562	4	1453

BPL for 100 or more origination-plus-deliveries

K4QLG	310	W6BHG	126	W7YHS	104
W9OME/5	303	W8DAE	125	K7AEZ	103
W4QDY	267	K6ZCR	117	K6GK	102
KH6AJF	232	W0KJZ	116	K2QHW	101
W4SHJ	198	K2S8X	115	Late Report:	
W5ZHN	146	K4CXN	114	W9OME/5 (Apr.)	110
K1DIO	139	K1DK	108		
W9ETM	137	K2VVL	104		

More-Than-One-Operator Stations

KG1DT	297	W1AW	111	W2CXM	106
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BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's issue: K1CMS W1EUT K2S8X K2VVL, W7BDU.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. possessions who report to their SCM a message total of 500 or more or 100 or more origination-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUL RM: AXA. PAM: TEJ. The PFN meets nightly Mon. through Fri. at 1800 on 3850 kc. The EPA meets every night at 1830 EST on 3610 kc. AXA still is looking for stations in the Lebanon-Reading Area to clear traffic. Reports from that area from high frequency nets will be welcomed and perhaps a system of liaison can be arranged. The grand picnic of all Pennsylvania nets will be held Aug. 23 at Hershey Park. PFN, EPA, WPA and 3RN members will be there. Others are invited. The Keystone ARC is celebrating its 10th anniversary. It was founded by a group of high-school operators who still are active members. CUL is routing overseas traffic 3 times daily using all modes, a.m., c.w. and s.s.b. EVY has received the Russian R-6-K award. HGN has enlisted in Uncle Sam's Navy. K3AXH is winner of the First Ed D. Hartman, W3OK, Memorial Award, sponsored by the Delaware-Lehigh ARC. IYS is a new OBS. HNK is now ORS. K3AHT has scored for Pennsylvania in the recent Delaware QSO Party. ZLP is the new EC for Luzerne County. ZZX is QRO with a Johnson 500 amplifier. The Mt. Airy V.H.F. Society will hold its annual picnic Aug. 9 at Flourtown. K3GQJ added a second jr. operator to his shack. The Etna Radio Club of Pittsburgh will sponsor the third Pennsylvania QSO Party. See announcement and rules in Sept. QST. Your EPA SCM will add to the prize list 5 log books to be given to the highest Pennsylvania scorers and 5 log books to the highest non-Pennsylvania entries. In closing my first report to you as your new SCM, I wish to openly thank all who sponsored me and made it possible. My thanks to JNQ, our former SCM for all his help. My wish is that I perform my duties as well as the past SCMs of your section. The ARRL invites all members and non-members alike to report monthly station activities. Active stations are invited to participate in League appointments. Applications for all may be made through your SCM. Traffic: (May) W3CUL 4016, VR 137, AXA 54, ZRQ 52, K3ANS 48, W3FKE 27, K3DPS 25, W3ZLP 24, K3DCB17, W0TEJ 17, K3AHT 16, W3BUR 14, L7IA 7, HNK 5, NQB 5, K3BKL 4, DZN 4, W3PVS 3, K3ELD 2, W3JSX 2. (Apr.) K3DPS 88, W3UCV 8.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Plummer, W3EQK—Asst. SCM: Ray De Courelle, 3DQZ, SEC: PKC. ECs: Prince George County, CVE; Washington, D.C., ECP; Garrett County, FNM; St. Mary's County, FUR; Carroll County, FVK; Baltimore County, JME; Baltimore City, MAZ; Washington County, OYX; Wicomico County, RXS; Talbot County, VVP; Cecil County, VZZ; Calvert County, WG. Maryland has 23 counties and listed above are ECs for only 10. How about some of you fellows in the other 13 Maryland counties getting in touch with the SEC or myself to help us fill that quota? There are 19 ORS appointments in Md.-Del.-D.C. and only 2 from Baltimore. The MDD Net needs more of you c.w. men to sign up as ORs and join the MDD Net for some mighty fine traffic-handling. The B&ORR Net meets Wed. at 6 a.m. on 3950 kc. PZW reports there were only 7 QNTs in May from a city as large as Baltimore! Dick reports K3HRC is going to help out as much as possible. K3ANA, a newcomer to ham radio, reports working more DX as well as all states but he still needs three cards. He's joined Army MARS and PVRC. UE also remarks on the help received by MDD from K3HRC. The St. Mary's Amateur Radio Assn. reports the club is active and growing fast. Fellows, meet the Kunz family—IWJ, son Paul; MME, mom Emmy; KN3EXQ dad, Rudy; and KN3EXR sis Jean. CN, XNM, K3WBJ and K3GJD send reports. If you want to read about yourself and your friends in this

column, fellows, you'll have to send me the news so that I receive it not later than the fifth of each month. EOY, a new OPS, reports working WAR-AIR and USS on Armed Forces Day and had no trouble copying the message. EOY questions the date on the USAF insignia on the NSS QSL for Armed Forces Day, which reads MCMXCVII. CDQ attended the Wash. Mob. Club Dinner and met K8BTY, ex-W3LSX. BVL reports B&ORR Club Certificates No. 8, 9 and 10 went to YVVS, K8KZF and K2RTN, respectively. MAH now has new v.f.o. on 75-meter phone. Bill also reports the passing of BFX on May 5. K3GJD is out of Johns Hopkins U. and expects to be active on MDD. GQF, J.H.U.'s club station, is on with 1 kw. and a 71-ft. tower with a Tri-bandner. EQK made arrangements with the U.S. Navy for a group to visit the Navy Radio Receiving Station at Cheltenham, Md., June 20. YBQ showed ARRL film, "Field Day at DK" at the BARC June 1. Dr. Paul Siple gave a very interesting talk on "Antarctica" at the quarterly meeting of FORAC, Inc., at Red Cross Chapter House May 29. NNX is visiting his non-ham brother Jim at Ormond Beach, Fla. AVS recently went to Wright-Dayton and attended the Hamvention at Dayton while there. UYJ still is working on the Mowhawk alignment. PIL snagged some 8V9's on 10-meter s.s.b. CZY is working to get the 40-meter rig going. K3AKB is building a 350-watt rig. Ed Tilton, of ARRL, gave a very interesting talk at the National Capital V.H.F. Club May 6. The WAYLRL and BARC have approved taking over Auto-Call by the Foundation. Let's clean up some of our operating procedure, fellows. Make your calls short and sign your call frequently when calling CQ or when calling another station. Traffic: (May) W3AHQ 367, PZW 233, K3ANA 203, WAUE 193, PQ 130, WG 70, K3WBZ 72, W3COK 61, BUD 60, TN 29, CN 28, EOY 17, ZNW 13, EQK 6, K3GJD 4, W3JZY 4. (April) W3PZW 382, COK 147, WV 9.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW, W2YRW and W2ZL. N.J. Phone and Traffic Net certificates were issued to K2CJB, K2JJC, K2ZVW and K2OWM. These certificates were issued in recognition of consistent QNTs. K2BNS, Burlington, advises that W2FFV is a new local. W2RG, Merchantville, is enjoying his retirement. W2ZL, Trenton, attended the Conaugh Valley Amateur Club Annual Banquet and received the "Grand OM Award." W2BEI, Audubon, is heard nightly on NJN. K2SOL, Sewell, Gloucester Co. EC, is building a tri-band quad. The Southern Counties Radio Club's Field Day chairman was K2PJD, assisted by W2TUR. The club code classes are conducted by K2YYB and K2ZYV. A very fine report was received from K2BRG, Atlantic Co. EC. Again we supplement W2RL, NJN Manager, on a fine net bulletin loaded with information and interest. K2HOD was the Burlington Co. Radio Club's FD Chairman. The SJRA's guest speaker for May was W2ZK. The N. J. license plate bill continues to gather supporters. K2DSL, Trenton, attended Georgian Court College the past season. K2SHT, Trenton, is heard almost nightly on 2 meters. The SJRA's Directors Net meets Mon. at 2130. W2JAV, the club's president, is NCS. The picnic and hamfest season is near so keep me advised of dates. The section's ECs are as follows: K2ARY, K2BRG, K2EFA, K2GWK, K2MBD and K2SOL. Please contact me for AREC registration. Traffic: (May) W2RG 154, W2ZL 28, K2OOK 18, K2OWM 13, W2BEI 10, K2SOL 7, K2CPR 1. (Apr.) K2JGU 126, K2OOK 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2GBX. RMs: W2RUF and W2ZRC. PAMS: W2PVI and W2LXE (v.h.f.). NYS CW meets on 3615 kc. at 1800. ESS on 3590 kc. at 1800. NYSSTEN on 3925 kc. at 1800. NYS C.D. on 3590.5 and 3993 kc. at 0900 Sun. TCNP 2nd call area on 3707 kc. at 1900. IPN on 3980 kc. at 1600. K2SIL and K2SSX made BPL in May. K2UTV has been named asst. mgr. of NYS C.W. The NYS bulletin was received from W2RUF, net mgr., and net data for the first four months shows NYS doing its usual fine job of traffic and net affiliation. Did you know that K2SSX is a teenager? The NYSSTEN will hold its annual picnic at Taughannock Falls Park near Ithaca on Aug. 22. K2QWD reports a v.h.f. traffic net, the Central N.Y. Traffic Net, has been started and meets on 50.700 Mc. Contact K2QWD or K2ZBU for details. Appointments: K2QKM as EC Orleans; K2ISO, EC Wyoming; K2-

(Continued on page 102)

HATS OFF TO HAM CLUBS

ONE of the most pleasant events of the year for midwestern radio amateurs is the annual Hamfesters Picnic, sponsored by the Hamfesters Radio Club of Chicago, Ill. This year it will be held on August 9th in Santa Fe Park.

IT is the midwest's largest single gathering. More than 3,000 amateurs are expected to participate.

WE NOTE with special interest that the 1959 celebration will mark the Silver Anniversary of the Hamfesters Club. It's an occasion, we think, that deserves a review of the principles and objectives that have made ham clubs the world over about as worthwhile a group activity as any we know.

IN THIS country alone, there are thousands of local ham clubs that meet regularly, and enthusiastically, for friendly discussion of the many interesting facets of our favorite hobby.

BUT FAR beyond mere discussion, most ham clubs perform continuous and important services, not for amateur radio alone but for their entire community.

GUEST speakers are invited regularly to talk on technical topics, such as antenna design, operating techniques, or unusual circuitry. Every amateur can learn more about his hobby from such talks.

FREQUENTLY, the only source of public information on amateur radio is the local ham club. Through its efforts, the local community is kept informed on the many services that are performed by their neighbors.

CLUBS frequently sponsor code and theory classes that are the stepping stones for a great many to obtain amateur radio licenses.

AND, of course, in times of national emergency or disaster the ham club itself in many cases becomes the focal point of a priceless community service.

SEVENTY-FIVE years ago, a handful of Chicago radio amateurs met to organize Hamfesters Radio Club, Inc. Today, its more than 250 members continue to build on the same solid foundation of objectives set forth in the Hamfesters by-laws in 1934:

1. To promote personal acquaintance and friendly relations among its members.
2. To promote greater knowledge of radio among its members.
3. To take general interest in all problems and matters concerning amateur radio involving any of its members, and to take such action as may be deemed advisable in the premises.

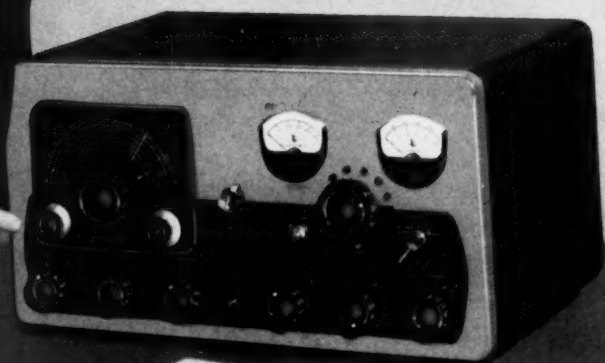
SIMPLE, powerful and fundamental principles like these — through ham clubs the world over — are the heart and soul of amateur radio.

— TRAVIS MARSHALL, K9EBE, Hallicrafters

— JORDAN KAPLAN, W9QKE, President
Chicago Area Radio Club Council

Buel Bellin Jr. *W. J. Haligan* W9AC for **hallicrafters**

no matter what you expect
from a transmitter...



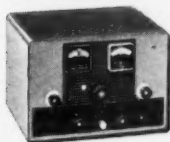
More than one-half kilowatt of power and operating convenience!

VIKING "FIVE HUNDRED" TRANSMITTER

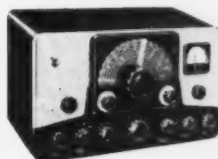
Rated 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! Compact RF unit designed for desk-top operation—power supply/modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Operates by crystal control or highly stable, built-in VFO. Class C 4-400A final amplifier provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Wide range pi-network output circuit with silver-plated final tank coil will load virtually any antenna system. Low level audio clipping—effectively TVI suppressed and filtered. Complete with tubes, less crystals.

Cat. No.	Amateur Net
240-500-1 . . . Kit	\$749.50
240-500-2 . . . Wired	\$949.50

you'll get more with a *Viking*



"CHALLENGER"—70 watts
AM input 80 through 6, 120
watts CW input 80 thru 10
—85 watts on 6. With tubes.
Cat. No. Amateur Net
240-182-1... Kit ... \$114.75
240-182-2... Wired . \$154.75



"RANGER"—75 watts CW
and 65 watts phone in-
put. Bandswitching 160
through 10. Built-in VFO.
With tubes.
Cat. No. Amateur Net
240-161-1... Kit . \$229.50
240-161-2... Wired \$329.50



"VALIANT"—Instant bandswitching 160
through 10, 275 watts input CW and SSB
(P.E.P. with aux. exciter) 200 watts phone.
With tubes.

Cat. No. Amateur Net
240-104-1 Kit \$349.50
240-104-2 Wired . . . \$439.50

"KILOWATT" AMPLIFIER—This exciting
unit is the only power amplifier available
which will deliver full 2000 watts SSB*
input and 1000 watts CW and AM! Continuous
coverage 3.5 to 30 mcs. Excitation
requirements: 30 watts RF and 10
watts audio for AM; 10 watts peak for
SSB.

Cat. No. Amateur Net
240-1000... Wired and tested . . . \$1595.00
251-101-1... Matching desk top, back and 3
drawer pedestal... FOB Corry, Pa... \$132.00

*The FCC permits a maximum of one kilo-
watt average power input for the amateur
service. In SSB operation under normal
conditions this results in peak envelope
power inputs of 2000 watts or more de-
pending upon individual voice character-
istics.

New Catalog

Yes, dollar-for-dollar and
feature-for-feature you'll get
more of everything in a
Viking transmitter . . . that's
why Viking transmitters outsell
all others! Write for your free
Viking Amateur Catalog and
you'll soon see why your best
transmitter buy is a Viking!



3 feature-packed amplifiers!



"COURIER" AMPLIFIER—Class
"B" linear rated 500 watts P.E.P.
input with aux. SSB exciter—500
watts CW and 200 watts AM!
Continuous coverage 3.5 to 30
mcs. Drive requirements: 5 to 35
watts. With tubes.

Cat. No. Amateur Net
240-332-1 . . . Kit . . . \$244.90
240-332-2 . . . Wired . \$289.50



"THUNDERBOLT" AMPLIFIER—
Rated 2000 watts P.E.P.* input
SSB; 1000 watts CW; 800 watts
AM linear! Continuous coverage
3.5 to 30 mcs. May be driven by
"Ranger", or other unit of com-
parable output. With tubes.

Cat. No. Amateur Net
240-353-1 . . . Kit . . . \$324.50
240-353-2 . . . Wired . \$389.50



E. F. JOHNSON CO.

2815 SECOND AVENUE S.E. • WASECA, MINNESOTA

Viking

FIRST CHOICE AMONG THE NATION'S AMATEURS

BUILD YOUR OWN



HAM GEAR



HEATHKIT HAM EQUIPMENT
IS DESIGNED BY HAMS
WHO KNOW YOUR
PROBLEMS AND
NEEDS.

PROVEN, "ON THE AIR"
PERFORMANCE



"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.



HEATHKIT VHF-1 **\$159⁹⁵**



HEATHKIT DX-20 **\$35⁹⁵**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATH COMPANY Benton Harbor, Michigan



a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement... plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.



HEATHKIT MT-1
\$99⁹⁵



"COMANCHE" MOBILE HAM RECEIVER KIT

Everything you could ask for in modern design mobile gear is provided in the "Comanche"... handsome styling, rugged construction, top quality components... and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.



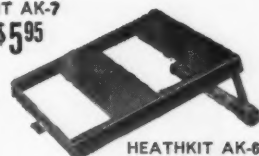
HEATHKIT MR-1
\$119⁹⁵

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2 1/2" D. Shpg. Wt. 4 lbs.



HEATHKIT AK-7
\$5⁹⁵



HEATHKIT AK-6
\$4⁹⁵

HEATHKIT MP-1
\$44⁹⁵



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4 1/4" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT
PM-2
\$12⁹⁵





COMPANION UNITS



HEATHKIT TX-1 **\$234⁹⁵**

"APACHE" HAM TRANSMITTER KIT

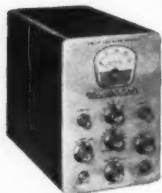
The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

HEATHKIT SB-10 SINGLE SIDEBAND ADAPTER KIT

\$89⁹⁵

Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. **\$8.95**.



HEATHKIT AR-3

\$29⁹⁵

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. **\$4.95**.



HEATHKIT QF-1

\$9⁹⁵

"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive 3/4" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



HEATHKIT AK-5
\$995



HEATHKIT RX-1 \$27495

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandwidth. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



HEATHKIT AM-2
\$1595

REFLECTED POWER METER KIT

The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



HEATHKIT B-1
\$895



HEATHKIT VX-1
\$2395

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

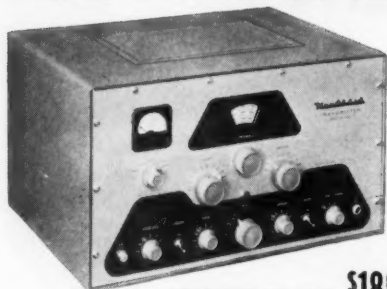


HEATHKIT VF-1
\$1950

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B \$189⁵⁰

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

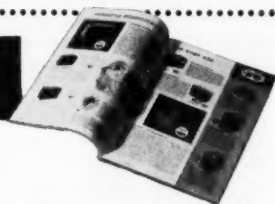


HEATHKIT DX-40 \$64⁹⁵

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.



HEATH

COMPANY

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do-it-yourself
electronics*



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All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only.

NAME _____

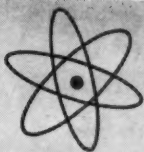
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CITY _____

ZONE _____

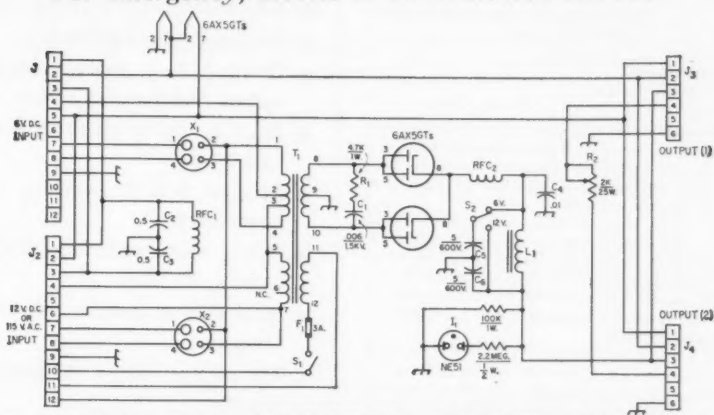
STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE



MALLORY HAM BULLETIN

For emergency, mobile or home-station use...



A UNIVERSAL VIBRATOR POWER SUPPLY*

In this and any other vibrator circuit, you'll get more efficient operation when you use long-life, sure-starting Mallory vibrators. Both X_1 and X_2 in the above circuit are Mallory vibrators... a 6-volt Mallory 4501 for the former, and a 12-volt Mallory G-4501 for the latter. The product of 30 years' experience and intensive research, Mallory vibrators are the outstanding choice of discriminating original equipment manufacturers, radio amateurs and top service technicians. Your distributor will give you prompt and helpful service in choosing the components you need.

MALLORY—For outstanding all-around performance...



RMC Discaps®... for C_1 hash-filter capacitors, disk ceramic. They're available in the file-card five pack.

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FP Capacitors... for C_2 and C_3 ripple filter capacitors... FP's are the original 85°C capacitors.



GEMS... for C_1 buffer capacitor, tubular plastic... give outstanding service, in easy-to-use dispenser.

*See circuit on page 493, 36th edition, Radio Amateurs Handbook, for complete list of parts.

P. R. MALLORY & CO. Inc.
MALLORY

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked— with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XX
ZL5AA	KH6UJ	VK9AT
CO2WD	KL7BUZ	VK4JCJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EI4N	KZ5CS	VP6TR
F8VQ	LA3SG	VP7NM
F8BZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	VS1HC
G3DOG	OK1FF	VS2DV
GC8DO	ON4AY	VS6LN
GI3WUI	KG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PA0FAB	YN1JW
HA5KB	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY0NE	ZE1JV
HI1LO	SM5AQ8	ZK1BS
ITMV	SP6BY	KH6MG/ZK1
JATANG	TI2LA	ZK2AD
JZ1HA	UA1AU	ZL1ABZ
W1AW	UA1KK8	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU



FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	<input type="checkbox"/>	\$29.95
10-15 TWO BANDER.....	<input type="checkbox"/>	34.95
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midjets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95
----------------------------------	---------	-----------------------------------	---------

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95
---	------	--------------------------------	-------

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<input type="checkbox"/> Beam #R6 (6 Meters, 4-El)...	\$38.95
<input type="checkbox"/> Beam #R10 (10 Meters, 4-El)...	40.95
<input type="checkbox"/> Beam #R15 (15 Meters, 3-El)...	49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

<input type="checkbox"/> Std. 2-El Gamma match	19.95	<input type="checkbox"/> T match	22.95
<input type="checkbox"/> Deluxe 2-El Gamma match	29.95	<input type="checkbox"/> T match	32.95
<input type="checkbox"/> Std. 3-El Gamma match	26.95	<input type="checkbox"/> T match	29.95
<input type="checkbox"/> Deluxe 3-El Gamma match	36.95	<input type="checkbox"/> T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<input type="checkbox"/> Std. 2-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 2-El Gamma match	31.95	<input type="checkbox"/> T match	34.95
<input type="checkbox"/> Std. 3-El Gamma match	34.95	<input type="checkbox"/> T match	37.95
<input type="checkbox"/> Deluxe 3-El Gamma match	46.95	<input type="checkbox"/> T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

<input type="checkbox"/> V40 vertical for 40, 20, 15, 10, 6 meters.	\$14.95
<input type="checkbox"/> V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....	\$16.95
<input type="checkbox"/> V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....	\$18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

FREE! FREE! FREE!

Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered, element information, size of elements, boom lengths, power and decibel gain figures, weight, feed line used, polarization, and other valuable information. Send card today!

Name.....

Address.....

City.....Zone.....State.....

Special HARRISON

"HAM HEADQUARTERS, USA"®

Summertime Offer

(GOOD 'TIL SEPT. 30th)

FAMOUS HARRISON ROOF-TOP TOWER

(HUNDREDS GIVING STURDY, DEPENDABLE SERVICE!)

10 FEET OF RUGGED, HEAVY DUTY BEAM SUPPORT — HOT-DIP GALVANIZED — MOUNTS ON FLAT OR PEAKED ROOF.

and CDR "HAM ACCEPTED" AR-22 ROTOR WITH AUTOMATIC INDICATOR

both for only \$55.00

plus **FREE!** Rotor Post for mounting AR 22 inside tower.

FREE! 3 sections of Signal Corps AB-85 mast. Cost Govt. \$5.75 ea. High strength aluminum alloy. Heavy 1/2" wall, 1" OD, 3 feet long. (Total lock-jointed length 8 feet.)

FREE! Sleeve bearing for mast, fits inside 2" ID tower top.

*AB-85 MAST SECTIONS. Ideal for portable or permanent vertical antenna, or mast. (With guying, up to 100 feet!) HARRISON Special—\$1.25 each, plus \$1.00 per order packing.

WANT TO GO UP HIGHER?

Insert ten-foot booster sections above flared support legs. \$18.95 each, with hardware.

HARRISON IS HEADQUARTERS

for MILLEN

NEW! TRANSISTORIZED TONE MODULATOR FOR GRID DIPPERS.

Compact, plugs into phone jack of GDM and modulates output at 800 cps. Internal mercury cell — 84c add't'l.



\$15.00

HARRISON IS HEADQUARTERS

for **KUPFRIAN** TRANSISTORIZED POWER SUPPLIES

ASK FOR LITERATURE.

Come to our big Summer-long ALTERATION SALE! Price slashed clearances in Equipment, Parts and the famous HARRISON TRADE-IN CENTER. Come early — come often!

"Ham Headquarters, USA" . . . Since 1925

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NEW YORK 7, N. Y.

• PHONE: BARCLAY 7-7777

[LONG ISLAND—144-24 HILLSIDE, JAMAICA]

Station Activities

(Continued from page 90)

AGC, EC Schuyler Co. Endorsements: W2FE as OO, K2BBJ as OPS. Lancaster hams have formed a club called "The Radious" with K2RDB, pres.; W22BF, secy.-treas.; W2EBE, dir.; K2RSH, dir.; W2UXV, tech. adv. W2COB topped W.N.Y. in the Jan. CD Party; he also received YLCC K2RWV has a new 15-meter beam. W2PGA and W2BRP supplied the muscle power. K2KGN has built a new 6-meter converter. More than 600 attended the RARA Hamfest. W2ICE was general chairman with K2HIT in charge of tickets and K2TMM in charge of prizes. W2UJS won first place in the code-receiving contest using a pencil at 40 w.p.m. K2KNV was second at 35 w.p.m. W2RUF and W2YGW acted as judges. Another fine "ham family day," sponsored by the Rome Radio Club, was attended by 150. W2CXM, the station at Cornell ARC, made BPL because of "Engineers Day." New officers are K2OGG, pres.; K2DEM, vice-pres.; Barb, secy.; Lester, ex-KN2MIM, treas. Newly-elected officers of the Auburn ARC are K2QLE, pres.; K2QXN, vice-pres.; K2IAK, secy.; K2ZOD, treas. W2E2P reports that the boys in Plattsburgh have organized a club and now have 24 members. Traffic: (May) K2SLI 710, K2SSX 44, W2EZB 257, W2RUF 185, K2IYP 131, K2JBX 116, W2CXM 114, K2DPA 78, W2TPV 74, K2LZJ 73, K2GWN 66, K2HAT 66, K2AOQ 62, W2OE 57, K2QDT 53, W2FEB 46, W2PGA 38, K2EQB 36, K2IMK 29, K2RWV 24, K2KYH 21, W2RQF 21, K2TDV 21, K2EE 12, W2BKC 10, K2OQO 7, W2PVI 7, K2BCL 5, W2QCI 4, K2MWS 3, W2ZBC 3, K2HUT 2. (Apr.) K2AOQ 91, K2RWV 46, W2BLO 9, K2EQB 6.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RMs: GEG, NUG and LXU. PAMS: AER. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Penna. Fone Net meets Mon. through Fri. at 1800 EST on 3850 kc. A new ORS appointee is K3CLX. The Conemaugh Valley ARC held a very successful Old Timers Nite May 9. The evening was dedicated to the amateurs who participated in the 1936 flood activity. ZEI, Ed Raser, won the Old Timers trophy. Others who traveled to the event were 4QDY, 4SHJ, 3UE, YA, UA, BRC, KZW, NUG and UHN. LXU is attending summer school in New Jersey. K3CLX has been busy putting up antennas. New officers of the Westmont Hilltop ARC are IWT, pres.; KBZ, vice-pres.; and K3AFY, secy. WZW won the Communicator III at the Breeze Shooters Hamfest. K3AOD writes that the Monessen ARC now has a membership of 40. Steel City ARC reports via *Kilo Watt Harmonics* that club meetings are now held the 3rd Tue. of the month at 1930 EST; the club station was very active in the April V.H.F. Contest; UHM has the photography bug. WZW has a Klystron on 3500 Mc. UVD reports the formation of the Foot-hills Radio Club in Westmoreland County with the following officers: LWW, pres.; UVD, vice-pres.; K3CEW, secy.-treas. The Breeze Shooters Hamfest at North Park was a huge success. Word from AWU, who is stationed at the Air Force Base, Blytheville, Ark., is that he is operating K3FJA on v.h.f. Up Erie way: The RAE held its meeting at the General Telephone Company's Building and took in a tour of the place; a tureen style picnic was held June 6 at Corry in honor of WAQ and ZFB, who are moving out of the State; LSS has obtained a DX-40 rig to be used at the Boy Scout Camp. The Etna RC reports via the *Oscillator* that among the visitors at the Dayton Hamvention were CTX, HWU, KHY, RMS, TOC, UEN, K3AOB and K3DCZ. TOC has accepted an appointment as Code Consular for the Boy Scouts; TVW has been under the weather. SIJ has 59 countries confirmed on 80-meter c.w. K3ICN is recuperating from the measles. Congratulations to HIB, LQS, UL, UGV and UZB on the fine showing in the February Frequency Measuring Test. LQS had an average error of 1.4 parts per million. New stations appearing on the WPA Traffic Net are K3CLX and K3ICN. GEG's subject was "Spark Days" at the May meeting of the ATA. Traffic: W3LNU 209, KUN 37, K3ICN 32, W3UHN 30, K3CLX 29, W3WRE 22, KN3GHH 3, K3COT 4.

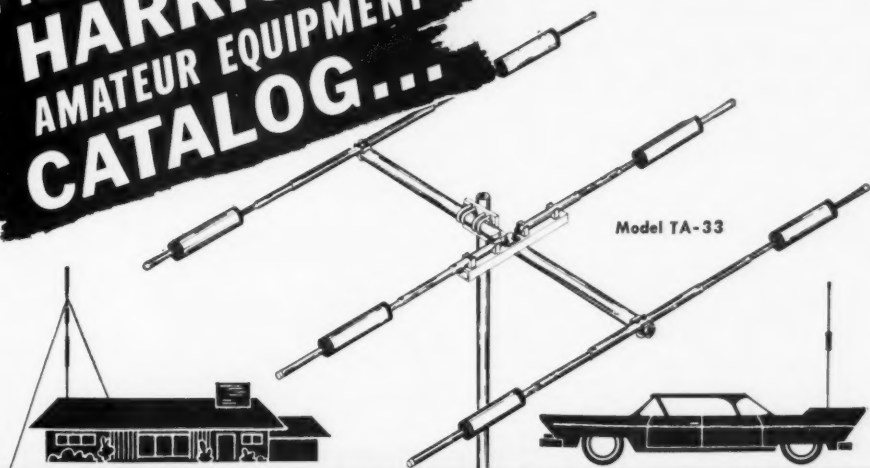
CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYL. EC Cook County: HPG. Section net: 3515 kc. Mon. through Sat. at 1900 CST. The St. Louis gang is busy making final arrangements for the combined Central and Midwest Division Convention to be held Aug. 23 and 24 at the Chase Hotel, St. Louis. Advance programs and announcements have been re-

(Continued on page 104)

TAKE A PAGE FROM THE NEW HARRISON AMATEUR EQUIPMENT CATALOG...

EXPERIENCED HAMS SAY
"THE MOSLEY"
ANTENNA PERFORMANCE!



Model TA-33

100% RUST-PROOF! STABLE ALL-WEATHER PERFORMANCE! GUARANTEED!

MODEL TA-33—Three-element beam rated to full KW. 8 db. forward gain; 25 db. front-to-back. 1.1/1 SWR. Max. element length 28'. Boom length 14'. Turning radius 15½'. Shipping weight 53 lbs.

Net Each **\$99.75**

MODEL TA-32—Two-element beam rated to full KW. 5.5 db. forward gain; 20 db. front-to-back. 1.1/1 SWR. Max. element length 28'. Boom length 7'. Turning radius 14½'. Shipping weight 32 lbs.

Net Each **\$69.50**

MODEL TA-33 Jr.—Three-element beam rated to 300W. 8 db. forward gain; 25 db. front-to-back. 1.5/1 SWR. Max. element length 26'8". Boom length 12'. Turning radius 14'9". Shipping weight 28 lbs.

Net Each **\$69.50**

MODEL TA-32 Jr.—Two-element beam rated to 300W. 5.5 db. forward gain; 20 db. front-to-back. 1.5/1 SWR. Max. element length 26'8". Boom length 6'. Turning radius 13'9". Shipping weight 22 lbs.

Net Each **\$49.50**

MODEL V-3—10-15-20M Vertical rated to full KW. Electrical quarter wave on each band. Requires only short radials. 11'6" from base to tip. Complete with baseplate, guy line, necessary hardware. Shipping weight 8 lbs.

Net Each **\$22.95**

MODEL V-3 Jr.—Same as V-3 but rated only to 300W. Overall height 11'9". Shipping weight 6 lbs.

Net Each **\$17.95**

MODEL V-4-8—D

Vertical with

switching

full

quarter

complete

for guy

hardware

Net

Model

ING COIL—(or 7)

eration of V-4

easily

weight

Net

POWER

SING

ANTEN

Full-sized

rust-proof

TRAPMOBILE 10-15-20M MOBILE ANTENNA

MODEL MA-3—10, 15, 20 meter Mobile version of the famed TRAPMASTER. Stainless steel whip sections. Fits standard mounts. Length 7'8". Shipping weight 8 lbs.

Net Each **\$19.95**

MODEL A-315

db. 5

TAKE ALL THE PAGES
of this COLORFUL
ALL-AMATEUR CATALOG
and you'll be a
*VIP

*(Very Informed Purchaser)!

It's chockfull of all the
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ceived and they should please all segments of the amateur fraternity. See you there. HPG, Vice-Director of the Central Division, was seen making conversation with old and new friends at the Starved Rock Hamfest. K9KYP advises this column that he is NCS for a new 6-meter net working at 5.26 Mc. on Thurs. at 2000 CDT. It is to be called the KLN Net. New officers of the Albany Park Amateur Radio Club are K8s, EGJ, EXP and ISP. JIN was elected vice-pres. of Chicago Section, Instrument Society. TZN reports that his new 20-meter beam is bringing back his interest in DX. K9MDK also is working the tough ones with a new Adventurer on c.w. GSB is modernizing his receiver and will join the latter in distance-hunting. New hams heard were KN9SDI, KN9SPE, KN9SHR, KN9SHQ, KN9SAQ and KN9SAT. K9PPX and K9MYQ have received their General Class tickets and have new Johnson equipment. K9ACH is in Turkey and hopes to get permission to set up his gear there. The Northwestern University Amateur Radio Society (Evanston) has been approved by the League as an affiliated club. John Huntton, ILVQ, was a guest at the CARCC May 20 meeting and gave an informal talk on the 1959 Board of Directors' Meeting. TEC is back on the air on 2 meters. The Ottawa c.d. unit, with CD Director VOK in charge, visited the Chicago Fire Department and was taken on a tour of the Chicago Firehouse, fireboats, etc. NIU is installing a new 100-watt transistor-mobile units. Carl Mosley, of Mosley Electronics, was guest speaker at the recent Montgomery County AREC Club meeting. K9AMD, of the same club, installed a new Mosley TA33 beam with the help of her family and others in the gang. CW reports that the North Central Phone Net handled 802 messages during May and also wishes it announced that the Annual Picnic will be held Sept. 13 at St. John's Sanitarium grounds in Springfield. The Midwest Traffic net also handled 166 messages during the same time. The Quad City Amateur Club was host to the Breakfast Club hams at their annual picnic and the boys came from several states to renew friendships. Traffic reports are low this month. The summer weather, vacations and outdoor activities must have substituted for the traffic. The Hamsters (Chicago) members are busying themselves for the Hamfest this summer. Some very fine prizes have been selected and it promises to be a fine turnout. Traffic: (May) W9IDA 1108, DO 520, KN9OCU 232, W9USR 154, MAK 132, K9ITU 82, W9FAW 55, K9ISP 55, W9CSW 42, K9MDK 10, BTE 7, IXX 6, W9JIN 6, GSB 2, SKR 2, K9KYP 1, W9TZN 1. (Apr.) K9CIL 46.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BDG, BKJ, MEK and UXK. RM: DGA, TT and VAY. Net skeds: IFN (a.m.) 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.) 1900 daily on 3920 kc.; QIN 2000 daily and RFN 0800 Sun. on 3656 kc.; QIN (slow speed) 1800 M-W-F on 3745 kc. New appointees are K9PTS as Clark County EC and JZU as OPS. JZU is very active on the sideband net. Officers of the new Hancock County ARC in Greenfield are DZC, pres.; ATG, vice-pres.; JAOJ, secy.-treas.; HKZ, chief operator; Roy Stiles, chaplain; and YWE, reporter. Those interested in the slow-speed net and in need of crystals can obtain them from VAY, RM or QIN, by sending 25¢ deposit plus postage. The only requirement is that you return the crystal when no longer needed. We are in need of more crystals that can be polished to this frequency. DOK reports that the DARA provided communications for the Armed Forces Day Parade. The Michiana ARC has started a summer code and theory class with BDG teaching the code. K9GSV reports OGE and PAW as new Gen. Cl. and MAN as Tech. in Whiting. The new call for the Clark County ARC is WWI. Reported from Winslow: K9MRL is active on 10 meter DX and short skip. K9KRN has 38 states toward WAS. KN9QAP put up a 15-meter dipole and QID is rebuilding his 600-watt final. The boys at Purdue are making arrangements to keep YB on all summer. FYM received BERTA and W-DEL awards. Net reports: BDG reports IFN traffic as 307; QIN, reported by VAY as 261; MEK gives ISN traffic as 179; K9GGL for IMQ 6-Meter Net, reports traffic as 64 and TT reports RFN traffic as 57. ETM and NZZ made BPL. NZZ has been heard on some of the low-frequency traffic nets since he got an 80-meter antenna. Many thanks to K9IXD, who wrote last month's column when I was called out of town unexpectedly. Traffic: (May) W9NZG 1307, VAY 377, ZYK 369, TT 219, ETM 205, BDG 169, MEK 74, QFQ 74, K9GBB 72, W9DOK 69, JOZ 68, FJR 65, BKJ 61, K9BSU 57, W9SWD 55, K9JKS 33, W9KON 51, K9HMC 49, W9TQC 47, K9IXD 46, AOM 39, AYI 31, W9ZPP 30, RTH 29, RVM 28, EIW 27, DDT 25, GJS 23, HUT 23, YXX 23, CC 22, K9JGG 21, W9DGA 17, DZC 15, IMU 13, QYQ 12, BDP 10, K9GSV 10, LZJ 10, DEX 9, K9NPDE 9, W9ENU 7, FYM 4, K9DVK 3, W9FJ1 3, K9PTS 3, KBW 1. (Apr.) K9AYI 99, W9SNQ 36, K9AZK 7, W9OCC 7, K9DVK 3.

WISCONSIN—SCM, George Woida, W9QKB—SEC: YQH. PAMs: NRP, GFL and K9IQO. RM: SAA. K9AEQ and K9EIT. HDZ has taken over as EC for Fond du Lac County replacing MPQ, who is to be congratulated on his good work since 1955. MWQ has a new Viking KW. The first trial run of the Brown County Tornado Warning System was a success, with IKY, HLD, K9JQE and DOL acting as mobile spotters. KN9SKU is new in Two Rivers. CCO is on with a new Viking I and both vertical and horizontal trap antennas. K9DAC and W9DYG made BPL. BEN certifies went to K9JIG and K9OOL, a WIN certificate to K9-DTK. The MRAC's new officers include MOT, pres.; QYW, 1st vice-pres.; RKP, 2nd vice-pres.; K9ENB, secy.; and KQD, treas. SAA will continue to manage WSSN with the endorsement of his RM appointment. The slow-speed net has become a well established net with credit due SAA. Our section needs Official Bulletin Stations on all bands. All applications will receive prompt attention. More OO and OES appointees also are solicited. New officers of the Oshkosh Club are RDI, pres.; ZGJ, vice-pres.; GNE, secy. RQK is active on RTTY and has discarded his kw. for a Ranger. K9OOL advises the TAN (Teen-Age Net) operates daily on 3955 kc. at 0700. Through the efforts of GPI, ONM and ELY, equipment has been procured from AF-MARS for a new "learners" program at Winnebago State Hospital. K9KJQ has been awarded a Milwaukee School of Engineering scholarship. PJT graduated from high school and will attend Oshkosh State Teachers College in the fall. Graduates from the U. of Wisc. include ZQA, YCK, OBA, WYU, K8s BRJ, IER, GWS, PJC and PJD. New officers of the BABC are YSC, pres.; K9EOP, vice-pres.; K9EEY, secy.-treas.; LPL, chief engineer. SZR will keep YT on the nets. Traffic: K9DAC 800, W9DYG 794, K9DTK 236, GYQ 178, W9-CBE 98, K9EIT 89, W9SAA 59, NRP 57, K9B 51, K9PDJ 28, GSC 19, W9VHP 17, K9DOL 14, W9WJH 13, K9IQO 11, LMX 11, GDF 8, W9PJT 8, OVO 7, VIK 5, K9ALP 4, W9MWQ 4, K9CEP 3, W9CCO 2, RKP 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W0HVA—SEC: K0JLW. Although there have been no net reports for the past few months, the 75-Meter Net still meets daily except Sun. and holidays on 3845 kc. at 1800 CST. New hams in the Dickinson Area are VTO and VST, father and son, formerly of Dakota City, Nebr. A new call in Jamestown is K0TIN. MER, of Marion, passed away recently. K0JLW is now working for the Northwestern Bell Telephone Company, and K0COV has taken a summer job with the North Dakota State Radio Department. K0AZX planned to take in the hamfest at Lewistown, Mont., during his vacation. K0JLW is back on the air mobile. Traffic: K0KJR 34, GRM 30, CMC 22, ADI 15, GGI 11, W0BAB 11, CAQ 10, K0ITP 10, W0DNJ 8, K0RLE 6, W0BHF 4, K0MFI 4, AJW 2, W0PHC 2, K0RMS 2.

SOUTH DAKOTA—SCM, Les Price, W6FLP—Asst. SCM: Gerald F. Lee, 8YKY. SCM assistants: FKE and NEO. SECs: YOB and GDE. PAM: SCT. RM: K0BMQ. The So. Dak. 75-Meter Phone Net, which meets daily at 6:30 P.M. CST and Sun. at 9:30 A.M. CST on 3870 kc., reports 36 sessions: K0BQR 4, K0DUR 3, K0BMQ 6, SCT 22, ZLB 1; QNI 692, high 31, low 8, average 19.2; informal traffic 90, high 12, low 0, average 2.5; informal traffic 66, high 7, low 0, average 1.83. The So. Dak. 40-Meter Phone Net, which meets Mon.-Fri. at 12:15 P.M. CST on 7225 kc.; reports 25 sessions. K0LXF 23, SCT 2; QNI 314, high 22, low 6, average 12.56; informal traffic 65, high 7, low 0, average 2.6; informal traffic 29, high 5, low 0, average 1.16. The So. Dak. C.W. Net reports 11 sessions. QNI 48, high 7, low 2, average 4.4; QTC 3, high 1, low 0, average 3; informals 3, high 1, low 0, average 3; NCSs K0BYR 4 and K0BMQ 7. On May 14, the Radio Club of Redfield held a get-together and had the Huron Radio Club members as guests. Those present from Huron were TXK, NCM, K0PDP, K0BHZ, SDK, NNX, K0TKQ, K0FTKN, ILL, Jim Mathews and Gene Holter. Those attending from the Redfield Club: SDG, FOQ, K0ASQ, K0AOR, UYA, IER, YVF, K0RRB and Darold Morey, ex-KN0LXE. K0DHA, the XYL of YVF, brewed up a special pot of coffee for NNX. KXZ was married May 23. Jack has been working for MJZ. K0LKH was confirmed May 17. While monitoring 3870 kc. Apr. 29, SCT heard a "CQ South Dakota." It turned out to be Mary Vosika, formerly of Gregory, operating HYQ/M in an Air Force plane near Redwood Falls, Minn. He asked me to convey his greetings to PRL, RMK, K0BQR and the evening net. K0MDF has his mobile back on the air in good shape after messing up the 80- and 40-meter coils with too

(Continued on page 106)

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much power! K0JOK also is mobile at USD, Vermillion. K0MOA hopes to have a 6- and 2-meter array up on the tower soon. K0OMP's first QSO after getting his new Apache transmitter on the air was UMIX, Bensen, Minn. K0VUCP built a Communique receiver and has a 50-watt transmitter. New Novices at Canton are KN0TVJ and K00SZM. Dean operates on 3709 and 7186 kc. while Larry nouns forth on 3790 kc. only. K0NHF has been holding schedules with K0LAPV, ex-W0WVJ, at Spenard, Alaska. New Novices at Canton are KN0TAY and KN0QMM. Lyle is on 3730 and 3735 kc.; Doug is on 3745 and 3715 kc. K0MOA suffered an apparent ruptured ulcer while in the doctor's office for an arthritis shot. Your SCM has been plagued for some time with a "buzz" in the Viking II but has had no time to look for the guilty component or condition. K0CWI reports talking to Dave Snyder, KH6BEW, who used to work phone in Rapid City. David Mendal is awaiting his license. K0RVD, ex-9GEC and K0CTO, formerly of Mitchell, has now moved to Minneapolis, Minn. Ed has a Viking 500 and a new HY-Gain beam on a 50-ft. tower. Listen for him on 40 and 75 meters. BJV is active on all bands, including 75 meters. Traffic: W8CST 435, K0DUR 101, W0DV is 66, K0BYV 19, W0FJZ 17, ZWL 12, K0DUR 11, LKH 8, R0J 7, W0FP 5, K0PLW 5, AIE 4, W0CTZ 4, FLP 4, K0LXH 2, QLN 1, RQY 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W0KJZ, Asst. SCM, Rollin Hall, W0SL, SEC: TUS, RM: RIQ, PAMs: QVR, TCK and TUS. Hearty congratulations to RIQ on being elected Route Manager of MSN. The same goes to K0IJD, as Manager of MJN. The MSN/MJN Party was well attended and held at the QTH of your SCM. K0IDV and BUO placed highest in the code-sending contest. The SPRC Banquet was attended by 100 OMs and YLs. K0ZUQ and his XYL, who are vacationing in Minnesota, attended the banquet with OYC and his XYL. TUS and VPO visited K0JZ, after Bob took an exam at the FCC offices. CZO is wiring a Viking 500. WMA and his XYL are going to vacation in Illinois and Wisconsin. KN0TNP is a new operator in Montgomery. K0H8O is a new member of the AREC. FT states that there are two new Novices in Albert Lea, KN0TLE and QWY. TCK has a new Heathkit mobile rig. KN0PYG has a new Hallicrafter 101. One of the Easton hams contacted an Easton, Pa., ham. K0ICG and family vacationed in W6-Land. The Mankato Area picnic will be held July 26. K0RPW handled his first message and worked his first DX, KH6BDV/K0J6, on the same day. A new YL to be heard on the Novice bands is KN0J8. A new AREC member in Hollandale is K00BP. Congratulations to K0IDV on receiving the 5000 Traffickers certificate. K0MNY has worked 84 counties out of 87. IIRJ is back on the air from Cromwell. K0BHF has a new s.s.b. HT-32 and 33 on the air in Fergus Falls. D0L attended the National Convention. VBD is going to Colorado. BUO had his OFS appointment renewed. K0IDV was appointed OBS on c.w. RA was appointed OO. K0JZ made BPL, her first one in '59. Traffic: W0KJZ 258, K0IDV 99, W0HEN 89, K0KYK 81, W0LST 55, TUS 45, K0MGT 44, W0KLG 35, UMX 32, K0HKK 28, W0OPX 28, K0IKU 27, W00JK 25, ALW 24, K0GCN 17, EPT 16, W00JG 16, TCK 13, WMA 13, K0MAH 12, W00ET 12, FGP 11, TWG 10, QVR 8, BUO 7, K0MNY 7, PML 7, W0VBD 6, D0L 4, K0QLM 4, W0RQJ 4, RIQ 3, K0IJD 2, RPW 2, W0SZJ 2.

DELTA DIVISION

ARKANSAS—SCM, Union M. Goings, W5ZZY—SEC: K0CIR. PAM: DYL, RM: K3TYW. There is a new Club in Fayetteville named the Fayetteville High School Amateur Club. The club station is K3QTC. This far the club has about ten members. K5APA is back on the air after a long absence. Activity seems to be at an all-time low. Very few reports were received and no news items. We would be very happy to have all the stations report activity and happenings for this news section of QST. Let us not forget to support the local nets and the NTS. Traffic: W5BYJ 232, K5TYW 44, THF 21, W40GY 6.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Emergency operations were in order because of that 11-inch rainfall of May 31. At about 7:30 p.m. May 31 a temporary station was set up at the PDO Headquarters where traffic was coordinated with the Parish Police, civil defense and other units. Activity was on the c.d. frequency in this area, 30.4 Mc. TYW volunteered his services and equipment at the PDO Hq. HRM and K5MBE assisted. Assisting the authorities by relaying messages and traffic from the flooded areas were K5SGP and K50EV, both operating mobile. From their fixed stations K5IHR and K5GFB assisted in the operation. K5DMA reports that the Baton Rouge Club had 3 stations operating on Field Day. GDY is now in politics. Fifteen members attended the BR Mobile Hamfest. MXQ has retired but not from ham radio. EA is building a new QTH in West Monroe. CEZ, who seems to be

the only one to make the BPL column consistently, is on a vacation. Though she doesn't tell what she has been doing, K5LKC reports that there are two new hams in Shreveport, KN5UKK and KN5UKJ (an XYL/OM team). They have a home-brew 6146 rig, an NC-100 and a crystal frequency of 3724 kc. WNR is back home from schooling in Oklahoma City. K5LHV is off the air because of rig trouble. SUA now is running a Ranger and is nearly ready to fire the kw. rig. Thanks, Marieanne. All ARRL appointees are requested to look at the expiration date on their certificates. Please mail them to your SCM for endorsement if necessary. Traffic: W5CEZ 604, MXQ 155, K5DMA 12, W5EA 6.

TENNESSEE—SCM, R. W. Ingraham, W4U10—Thanks to NHT, retiring RM, for a good job. Welcome to FX, our new RM. Let's all get behind Power and make the c.w. net tops. Thanks to PAH and UOT, who are continuing their jobs as PAM. Best of luck to K4JNK on his new job in the Armed Forces. We will miss Buster on the section nets. K4TPY is now manager of the Teen-Age Net. K4LPW and K4LTA attended PVRC and FRC meetings in Washington. UVP is on 2 meters with a Seneca and a ten-element beam. TDZ is planning a new modulator with compression and clipping and negative peak limiting for his 6N2. Thanks to RRY for taking another term as SEC. Congratulations to K4LWP, the new EC for McMinn County. Traffic: (May) W5RCF 930, W4PL 734, VJ 178, K4CNY 137, JAK 74, W4U10 28, UVL 21, K4UUF 20, W4TZG 19, PAH 17, CXY 15, TDZ 14, UVP 14, K4LPW 12, W4AOY 10, EIN 6, K4KYL 4, W4RRY 4, K4OUK 2. (Apr.) W4PL 689, UVP 16, K4LPW 14, TRY 5.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomsen, W4SUD—Asst. SCM: W. C. Aleock, ACDA, SEC: BAZ, RM: K4AIS. PAMs: GTC and K4MMW, S.S.B. PAM: MMY, V.H.F. PAM: K4LOA. The Mammoth Cave Hamfest was very successful with a large number of traffic men present. I believe our nets will be better as a result of the discussion. MMY, VJV and K4UCS moved a portable s.s.b. station to Downtown Owensboro Armed Forces Day. Traffic was invited from the public. VJV was top phone 88 man in this section. K4SBL and ZML will soon have 500-watt finals. K4IFB is spending the summer in Wisconsin. NRG is an active OBS. OO reports were received from ELH, EJA, SBL and K4BUB. BNW and TYP are new on KPN. K4QCN is a new member on KYN. Listen for early KYN on 7140 kc. this summer. Traffic: (May) K4VID, 339, ZML 193, W4ZBD 127, K4AIS 95, W4SUD 80, K4VTY 67, MIMW 64, CSH 61, W4GTC 55, HTD 36, CDA 32, K4QCN 30, PNA 27, SBL 27, W4HWO 20, SZB 18, K4KIS 9, W4YIY 9, K4SBZ 8, UCS 8, W4SZL 6, ELG 5, K4IFB 5, W4KJP 5, W4U 2. (Apr.) W4MMY 24.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN, RM: OCC, Q4Q and FWQ. Thanks, gang, for the three nominating petitions. Being retired should have time enough to do a good job. Because of the confusion of changing SCMs, mail and reports are light this month. Congrats to the new Kent Radio Club, Grand Rapids, on organization and ARRL affiliation. New appointments: K8GJD as OPS, K8CWI as OO, K8EXV as EC for Alger County. The QMN Picnic will be held Sun., Aug. 23, at noon at Potter Park Pavilion, Lansing. The BR/MEN and V.H.F. Picnics were held recently. OCC still is working QMN, SRN, EAN and MEN. FWQ is RM of the Summer QMN net. Q4Q is working QMN, SRN, EAN and EC Nets. K8GJD is an NCS on the BR/MEN Nets. DSE is on QMN, MEN and MARS Nets. AHV is on BR/MEN daily and OBS M, W, and F. ALG is on BR, SSB and AREC Nets. EGI has a different FAA job and should be on more now. HKT sends in a low report but says the new Apache is working fine. K8CKD is working nights. Please get Form 1 reports to me by the fifth of each month in order to make this report. All official appointments are now being rechecked. Traffic: (May) W8OCC 271, FWQ 188, Q4Q 148, FX 125, YAN 97, JKN 73, K8GJD 71, W8XOH 58, TBP 46, K8AEM 22, W8DSE 22, AHV 21, ILP 20, K8BQD 19, IYN 17, W8ALG 13, EGI 11, K8XNE 10, W8AUD 8, K8NAW 7, W8HKT 5. (Apr.) K8IYN 117, W8TIN 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: UPB, RMs: DAE and VTP. PAMs: HJZ and WYS. There were 3545 sets of amateur call letter license auto plates issued this year. Results of the Ohio Intrastate Contest are as follows: HPP, NEF, K8HDO, FEM, VDA, K8MH0, K8KSB, YGR, CPO, K8GWK, IGE/8, AL, YPT, NHO, OHO, DAE, VZE and EQN. There were no Novices taking part and in all it was very disappointing. Instead of giving you Ohio amateurs first crack at getting one of the very hard-to-get certificates exclusively, should the Ohio Council open this contest to the

(Continued on page 108)

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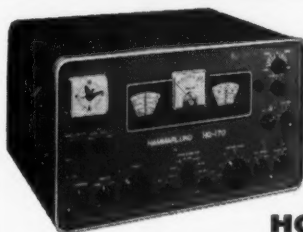
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A Word from Ward . . .



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rest of the country? The Council would like to have our constructive ideas on this matter. Toledo's *Ham Shack Gossip* names as its Hams of the Month the teen-agers of the area. You young folks should read the requirements for becoming an A-1 Operator. Follow these rules and you'll be a credit to amateur radio. VEK was winner in the Toledo V.H.F. Club's first hidden transmitter hunt of the year. Columbus ARA's *Curioscope* tells us the v.h.f. section of the CARA held what is claimed to be the first amateur radio club meeting to be held over amateur TV, the members gathering at the homes of two amateur TV stations, who in turn showed members at each station to the other station and conducted the meeting; the code and theory class still has 46 students; HAM has a new Tribander; new mobiles on 6 meters are HOL, UHZ and K8HRR; JSU has a new tower and beam. The Green Valley RC of Alliance will hold its second Annual Lee DeForest Day Celebration Hamfest Aug. 16 at the National Guard Armory, 1175 West Vine St. TBT presented IJL with a new jr. operator. ENS had a mild heart attack. K8BPY has the new Collins S line. K8MHJ now has an f.m. 6-meter mobile rig. K8IST has taken over editorship of Tusco RC's *The Beam* from 8TR. KN8OLJ is a new ham. Greater Cincinnati ARA's *The Mike and Key* tells us the club members were shown the Bell color film "Unchained Goddess." K8CAQ and his XYL were hospitalized after an auto accident. K8LDD received his General Class ticket at the tender age of nine. Our Great Lakes Director, your SEC and SCM attended the Springfield ARA's Annual Banquet and saw color slides taken in Africa. We then drove to the Dayton Hamvention where over 2500 registered, 945 attending the banquet. After the banquet the Ohio Council of Amateur Radio Club's cups were presented, one to the Ohio Valley ARA for the highest score in 1958's Field Day, another to RFP for winning this year's Ohio Intrastate Contest and the Hamvention cup to QQ as the outstanding amateur in a five-state area. ZOF, the Master of Ceremonies, introduced the key-note speaker, Lt. Gen. F. H. Griswold, K0DWC, whose subject was "Strategic Air Command and the Amateur." BZX sent me a newspaper clipping from Sidney showing a picture of Vinnie Emerich, 14 years old, who won the Collins S-line transmitter and receiver. K8HZN received a WAC certificate. The Buckeye Net (BN) will hold its third annual picnic Sat., Aug. 8, starting at 1100 EST in Mt. Vernon. I think it would be nice if the boys in the Ohio Phone Net would join us, making it an all-Ohio traffic nets picnic. Those who made BPL in May were DAE and UPH. Traffic: (May) W8UPH 1045, DAE 402, ZYU 387, QJL 109, VDA 77, AL 76, GKB 64, BZX 47, K8DHJ 43, CTQ 38, W8YGR 35, K8HGT 30, W8BEW 21, K8HUF 21, W8LT 21, SYD 16, K8DDG 15, W8QIE 15, K8KHS 13, W8FFK 11, K8HDO 10, W8WVS 10, K8RHH 8, W8PPY 8, 7, K8HEJ 6, W8HJZ 6, LMB 6, K8KSB 4, AIL 2, MHO 2, W8STF 2. (Apr.) W8IBX 66.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RM: W2PHX, PAMs: W2LJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, IPN on 3980 kc. at 1530, ESS on 3590 kc. at 2130, ENY (emerg.) on 29.490 Mc. (Thurs.) and 145.35 Mc. (Fri.) at 2100, MHT (Novice on 3716 kc. Sat. at 1300. Endorsements: W2PHX and K2UTV as ORS. Welcome to Pelham Memorial H.S. Club as a new ARRL affiliate. Sorry to report the passing of K2AE, the "dean" of local amateurs at 92 years of age. We'll miss the great "purple paiama," a colleague of Nicola Tesla in the early days of radio. Congrats to K2UTV on making BPL again. New Generals are WA2ALO and K2RZD. WA2CSZ has moved to Massachusetts. The NYSPTEN Picnic will be held at Taughannock State Park Aug. 22. K2CVG reports: 26 states on 6 meters. The Lakeland H.S. Club, K2OKZ/2, opened Field Day style with a generator during the Boy Scout Camporee. K2HXR received a Worked All Conn. Award from the JCs. New officers of the Yonkers Club are K2BIG, pres.; K2SII, vice-pres.; K2HGN and W2DDE, secretaries. IUFED, from ARRL was the club's speaker in May on the Geneva Convention. K2BEJ has a new Viking 500 and K2MBU a Comanche. K2BFU has a new 15-meter beam. The new president of the Schenectady Club is W2LCB. The Albany Club held an outing at Sacandaga Reservoir headed by K2KTN. Ulster County is active in RACES. The R.P.I. Club had a Lake George outing spearheaded by 1M1W/2, 1OQC/2, W2CEV and K2BDO. Among those working with State Officials to promote call letter plates are W2GM1, W2AAO and W2GTL. Traffic: K2UTV 1410, K2YZI 443, K2MBU 176, K2RKY 102, W2ATA 69, W2PHX 59, W2FFU 52, K2YTD 22, W2AKK 17, W2ZRS 11, W2MIS 10, W2VFP 9, WA2CSZ 7, W2BWE 5, WA2DJJ 4, K2CVG 2, WA2ALO 1.

(Continued on page 110)

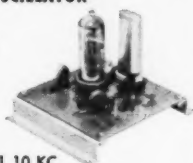


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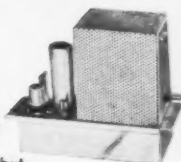
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for use with FMV-1 10 KC multivibrator
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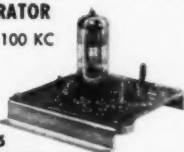
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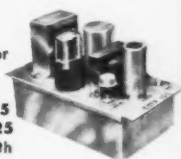
for use with FO-1L 100 KC oscillator

Kit, less tube **\$5.95**
Wired, with tube **\$8.95**
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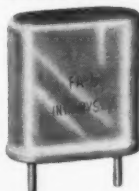
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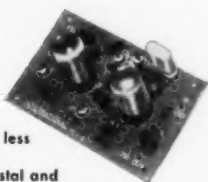
FCV-1 6 METER CONVERTER

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Wired with tubes and crystal **\$15.95**
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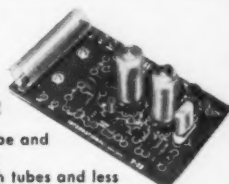
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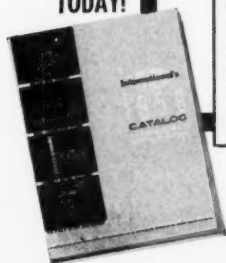
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NEW YORK CITY AND LONG ISLAND—Harry J. Dannels, W2TUK—SEC: W2ADO, RM: W2VDT. PAM: W2UGF, V.H.F. PAM: K2EQH, Section nets: NLI, 3630 kc. nightly at 1930 EDT and Sat. at 1915 EDT; NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDT; NYC-LI AREC, 3908 kc. Sun. at 1730 EDT; NYC-LI V.H.F. Traffic Net, 145.8 Mc. through Sun. at 2000 EDT. BPL cards were earned by W2KEB and K2QBW, the latter on originations plus deliveries. At the suggestion of W2LGK, our area ECs are listed for your information: Manhattan, K2JVB; Bronx, W2DUP; Staten Island, W2VKF; Brooklyn, K2CTK; Queens, W2LGK; Nassau, W2F1; and Suffolk, W2KNA. AREC and RACES questions may be addressed to any of the aforementioned men for their respective areas. All our section nets report that the welcome mat is out for all who would like to handle traffic and help complete section coverage. W2ABC and W2AHM moved to Maryland. W2LGK is working with transistor oscillators on 80 meters. K2YMU is on s.s.b. with a homebrew exciter and DX-40. A new three-element 2-meter beam is in use at K2IRS. K2DEM reports that the NYC-LI gang captured all the offices of the Cornell ARC as follows: K2OGG, pres.; K2DEM, vice-pres.; Barbara Lester, secy.; and ex-KN2MIM, treas. K2IBJ added a Johnson 6N2 to his Challenger rig on 50 Mc. K2PTS made 120 contacts in 8 hours in the C.W. CD Party, loading up a wire fence! Who needs antennas? K2TPU received his CPC-15 w.p.m. and added Alabama for a new state on 6 meters. K2YDR has a new Johnson 6N2 working and added Nebraska for his 39th state on 50 Mc. A new Ranger has been completed at K2VUI to assist his DXCC 168/152 record. Joe needs only a JT1AA QSL to complete WAZ. K2VBH and W2AJC assisted in an emergency involving a traffic accident on the Interboro Parkway. K2VBH relayed information on the 6-Meter L.I. Emergency Net to W2AJC, who contacted the police and relatives of the persons involved in the accident. This timely work received fine newspaper recognition. W2AEE added a new Telerex Tri-Band beam. W2IAG installed a new G-66B and his Viking mobile in a new Pontiac. The Queens 10-meter AREC performed a valuable public service by assisting in the American Legion Parade with mobiles W2IAG, W2LGK, W2MES, W2MMV and W2MZU; fixed stations W2AMI and W2JTO; and K2SVN with his walkie-talkie. The latter station provided the parade chairman with direct contact with all parade units. The Bronx HS of Science ARC elected K2KQH, pres.; K2JMB, vice-pres.; K2KJV, act. mgr.; and W2BGC, secy. K2KYS, ex-W1JW, and his Viking II and HQ-150 have helped tremendously on NLI. A new teen-age net is being organized on 40-meter phone by K2KJV and W2BVTU. W2DID built an Apache and companion s.s.b. exciter. K2IHD added a 10-meter mobile rig to his new car. W2KNA moved to Bayport. New officers of the Bayside ARC are K2OWT, pres.; K2HGR, vice-pres.; K2IVV, secy.; W2THU, treas.; and K2ILD, NCS. W2AEGK visited KP4-Land. K2JWD is building an Apache. K2HTX installed a TA-33 Jr. K2YHD added a new Tri-Band beam. Drive with care when mobilizing. Traffic: (May) W2KEB 3603, K2QBW 382, W2ABC 276, W2VDT 274, K2KYS 222, K2IBG 177, K2MIG 134, K2PHF 116, K2VCO 108, W2LGK 86, K2YMU 82, W2AEE 78, K2IRS 56, W2UGF 46, W2EW 45, W2JBQ 22, K2RHG 17, K2YQK 16, W2DU'S 15, W2GP 15, W2PF 14, K2VIX 14, W2DRD 8, W2EC 8, K2DEM 6, K2MYS 6, W2OBU 6, K2MEM 5, K2RBS 4, K2AZT 2. (Apr.) W2AEE 33.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN, RM: W2RXL and W2ADE. PAMs: K2VAC and K2KVR. The New Jersey Net meets daily at 1900 on 3695 kc. During May, 31 sessions were held with an attendance of 541 and traffic of 347. K2ZHK reports the NJSS had a slow month with an attendance of 54 in 21 sessions and traffic of 23. K2LWQ has installed a break-in system that works fine. K2JTU had his receiver damaged by lightning. W2CVW is now spending some time on 20-meter s.s.b. K2AGJ is giving code lessons to W2ECX on 7180 kc. at 1 p.m. K2MPF has a motorcycle and threatens to install a mobile rig on it. K2VYL, an ORS for four months, has made BPL every month—four times. This is the 25th year for the Tri-County Radio Assn. in the Plainfield Area. Congratulations. K2BPB is working on new 2-meter gear. K2VWV now sports 20 countries. W2V2B received a 10-w.p.m. Code Proficiency Award. K2ZMO, a new OPS, also is MARS. W2CQB spends plenty of time on CD as well as on c.w. traffic. K2IZN now is taking a 2RN assignment. K2VAB will be back shortly at Budd Lake for the summer. New officers of the Amateur Radio Club of Harrison are W2NKD, pres.; W2GCV, vice-pres.; K2DQX, secy.; K2OAS, treas.; K2SKK, gen. mgr. K2IBW needs KL7 for WAS. W2PTS has finished his modulator. All he has to do now is to get it working. W2BVE is working on a keyer for RTTY. W2BDV put

(Continued on page 112)



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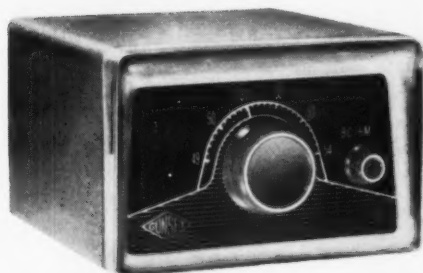


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Has sensitive RF stage for weak-signal reception, is highly stable, has low frequency drift. Triple conversion (including mixer in auto radio) gives maximum image rejection.

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up a new 40-meter antenna for K2UKQ. W2RON worked PAN and now has only 90 to go for DXCC. W2GVU sends his final report in N.N.J. and wants the boys to listen for him from the Philippines this winter. W2EWZ has racked up 14,000 QSOs. K2GIF was temporarily in the Army. W2TSQ now has a 35 ft. pole. Traffic: (May) K21ZN 205, K2GIF 172, W2RXL 147, W2ZVW 142, K2VVL 127, W2CQB 110, K2ZHK 87, W2EBG 55, W2RZO 54, K2MFF 45, K2LWQ 35, K2VAB 25, K2AGJ 24, K2ZMO 24, W2BVE 18, W2CVW 17, K2QYI 16, W2BRC 14, W2RON 14, W2ADE 12, W2DRY 7, K2ZLU 6, W2EWZ 4, W2OXL 4, K2LW 4, W2CJW 2, K2PBP 1, W2PTS 1. (Apr.) W2ADE 20, W2BVE 11.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W0BDR—The TLCC held its annual party May 23 in Cedar Rapids with an attendance of 25. K0BLJ was elected new net manager and GNX was elected asst. manager and reporter. K0BLJ has added Saturday to the TLCC schedule. The 75-Meter Phone Net will hold its annual picnic in Ames Aug. 17. GXP received an OPI appointment. Renewals: ATA as ORS and ZMU as EC. The Sioux City ARCC received the RACES go-ahead from the FCC. FZO is Radio Officer for Sioux City. The Great Lakes Radio Club held a picnic at Ruthven. The Baird Amateurs played host to a picnic at Baird with 80 present. The Atlantic group held a picnic for Southwest Iowa hams. ZYB made WAZ. The Fort Dodge 6-Meter Net now has 10 members. PAN is leaving for a 2-month cruise in the Far East. 9CXC and K8AHA visited BDR. BDR visited the SUI Radio Club at Iowa City. SCA is becoming active again in traffic after an enforced absence. K4BJJ, of Atlanta, is now K0TOO. The Sioux City ARC has purchased a house trailer to be used for its portable gear. GOG now has a 100-watt d.s.b. mobile rig. FKB and DWD are back on the 75-Meter Phone Net after a long absence. Traffic: (May) W0BDR 1915, LGG 1341, LCX 801, K0CLS 324, W0SCA 165, VWF 78, K0BLJ 67, W0NGS 65, K0AGJ 50, W0VQX 46, OFW 43, QVA 38, NTB 26, SLC 24, K0GNP 23, W0GNQ 21, JPI 19, FDM 15, K0HHC 14, KAO 12, AFL 11, OHD 11, W0YX 10, YDV 9, K0EXX 7, W0TTO 6, ADR 6, K0DPT 6, JGM 6, W0PAN 6, K0GOQ 5, KBX 5, BRE 4, W0VZ 2, K0QAI 1. (Apr.) W0ATA 2.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: IFR, Asst. SEC: LOW, RM: QGG, V.H.F. PAM: HAJ, RM QGG is enjoying a well-earned vacation in 6-Land visiting his son. K0BIX will act as RM during his vacation. MMM, also working in 6-land, will return this fall for his schooling. TTG operates mobile from Topeka to Kansas City while going to work and does a real job handling Topeka traffic while mobile. The Hi-Plains AR Club had its usual swell hamfest at Plains, May 17. Officers are K0DQR, pres.; 5PHM, vice-pres.; NIQ, secy.; NIO, treas. There were 378 present with 76 mobile stations. The SCM enjoyed meeting a lot of his hard workers in the Short Grass Country. The Kaw Valley Radio Club held its Annual Hamfest May 17. Officers are K0LAD, pres.; K0BJF, treas. There were 135 registered, an estimated 350 present and 45 mobiles. Our SEC IFR enjoyed his meeting and visit with them. K0BIZM has taken over as NCS KPN Sun. call. Let's not forget our other hard workers on NCS jobs. UTO, VUI, FHT on KPN, and K0BIX, FNS, QGG, K0IRL and W0SAF on QKS. Let's help them make the Kansas nets the best. Traffic: (May) W0BLI 854, OHJ 715, FNS 195, IFR 155, QGG 94, TOL 86, K0BIX 84, W0SYZ 60, K0MIF 50, IZM 46, W0ABJ 39, UTO 32, K0JVN 20, W0RJE 20, WIZ 20, FHT 18, K0IRL 17, W0TTG 13, VUI 12, K0TOA 10, W0WFD 7, ASY 6, K0EFL 5, GHY 4, W0BBO 3, DL 3. (Apr.) W0TOL 101, SAF 64, K0IRL 14, GZP 12, KMZ 8, TOA 4.

MISSOURI—SCM, C. O. Gosch, W0BUL—SEC: K0LTP, RMs: OUD and QXO, PAMs: BVL, OMM and K0KLC. Net reports: MON (0700 Mon. to Sat., 3850 kc.), 25 sessions; QNT 44, QTC 23; NCS OUD 25, MON (1000 Mon. to Sat., 3850 kc.), 26 sessions; QNT 124, QTC 124; NCS OUD 10, RTW 6, K0OJC 4, K0KBD 2, K0ONK 1, Show Me Net (Sun. 1600 3850 kc.), 5 sessions; QNT 15, QTC 8; NCS K0KBD 3, OUD 2, MEN (1800 Mon., Wed., Fri. 3885 kc.), 12 sessions; QNT 363, QTC 79; NCS OHC 4, OMM 3, VPQ 2, K0DXL 1, OVB 1, BUL 1. Appointments: K0DEW as OPS, YHT and IYL as ECs, K0QQC as OBS, Endorsement: WFF as ORS. K0SBJ has a new five-element beam. CPI has QRT Missouri and moved to Hitchcock, Tex. Lou was our most consistent traffic-handler. K0OJC reports activity on Armed Forces Day. OUD has a new t.r. switch and reports hand conditions poor for traffic-handling. BVL has been busy lining up exhibits for the Central Midwest Convention. K0HYV installed mobile gear in the new station wagon. Officers of the HARC (Kansas City) are K0AEU, pres.; K0BKE, vice-pres.; K0LIQ, secy.; K0AWT, treas. PUV is active in DX on 21-Mc. Al with 88 worked and 76 confirmed. IFM moved to a new QTH

(Continued on page 114)

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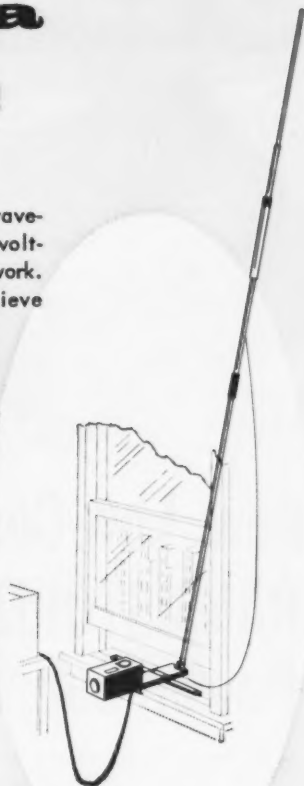
MODEL TT-31, TOTE TENNA with Tuning Unit, Coax Line & Window Mount. Amateur Net, \$80.00

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Here's the transistorized power supply you've been waiting for... quality-built to a new standard in "total-package" design by the company you know you can trust! It's C-D-R's new Model 12TP12 Transipower, and it's yours for only \$60, amateur net.

The Model 12TP12 converts a 12.6 VDC nominal input to an output of 500 VDC at 240 MA (120 W). Highly efficient and quiet, this compact (5 1/4" x 4 1/4" x 3") mobile power supply weighs only 1 3/4 pounds. In stock now at your C-D-R distributor. See him today, or write for full details to The Radiat Corporation, HAM Dept., Indianapolis, Indiana.

C-D-R also makes the famous HAM-M Rotor

and is operating with an all-band vertical. KØLTP, HUI and others of the SWMARC (Springfield) have set up a control center for emergency communications in the sheriff's offices. This is tied in with all types of communication in the area including the U.S. Weather Bureau. A severe-weather corps also has been organized by the MVHFC (St. Louis) with KØABA as chairman. Traffic: (May) WØCPI 823, KØONK 691, KBD 335, OJC 201, WØVPQ 81, OUD 80, UOL 78, ARO 49, KØMKJ 48, OEP 30, LGZ 25, WØOVV 21, BUL 16, WFF 12, BVL 11, KØIHY 5, WØQMK 5, GEP 4, VFP 4, KØDGT 2, WØGBJ 2. (Apr.) KØKBD 322, WØWYJ 61, WFF 6.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Western Nebraska Net, as reported by NIK, had QNI 516, QTC 62. The Nebraska Morning Phone Net, reported by KØDGW, had QNI 637, QTC 209. The Nebraska 75-Meter Phone Net, on 3983 kc, daily at 1230 CST, as reported by ZWG, had QNI 323, QTC 24. The North East Nebraska Radio Club held its Annual Hamfest at the Fair Grounds in Stanton on May 14 with a good attendance. The Dawes County Radio Club held its Annual Hamfest at Chadron State Park May 7. The North Platte Radio Club will hold its Annual Hamfest at Cody Park in North Platte on Aug. 2. RYG reports 18 stations confirmed on 2 meters and Bert is building a kw. rig for 2-meter s.s.b. BRS has a new 6- and 2-meter rig and is having a lot of contacts on 6 meters. Traffic: WØNYU 187, KØDGW 108, BDF 96, CDG 74, WØNIK 70, UOV 66, KØKUA 59, LJW 54, BRS 47, WØZWG 30, KØRR2 22, WØHOP 20, HTA 19, KØMISS 12, WØVEA 12, KØHKI 10, WØPUT 10, BOQ 9, KØELU 9, CBV 7, WØOCU 7, KØCYN 6, WØKDW 6, KFY 6, LFF 6, QKR 6, KØDFO 5, WØVZJ 5, KØFBD 4, WØWZR 4, KØKJP 3, LXS 2, MUB 2, WØAFG 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, WITYQ—AW made BPL, ORR is pleased with the t.r. switch from Feb. 1958 QST Hints and Kinks. BRS has a new Apache. FEA won three scholarships with an exhibit at the National Science Fair. QJM ran into old ship-mate 2TUK during Naval Reserve duty. FHP reports CVN handled 21 messages during 13 sessions and had a total of 128 stations check in. High QNI goes to FHP, 13; KIBML, KIAM, 11; KNIKEA, KNIKGI, HIG, 9; ZUQ, FFP, JZA, 8. New stations on CVN are JUD, GNS, KNIKJR and KNIKPW. KNILAF is a new Novice in Torrington. ZUQ is on s.s.b. New officers of the Willimantic RC are HHR, pres.; HNX, vice-pres.; TVU, secy.; MHF, treas. SKA assisted the Community Chest Parade at the U. of Conn. and the Jaycee Convention Parade in Willimantic. YBH advises that CPN handled 389 messages during 31 sessions with an average daily attendance of 31 stations. High QNI goes to KIAQE, KICBV, KIGCS, YBH, 30; KIBEN, FHP, TVU, 29; KICRQ, 28; KIBMM, DAV, MDB, VYV, VQH, 27. New CPN members are KIBCP and KIHOP. Section net certificates were issued to KICRQ, IHG, MDB and YMY. The recently-formed Canaan Amateur Radio Society (LUA) elected FRD, pres.; HRR, vice-pres.; KIBEN, secy.; MDR, treas. A V86 QSL gives KICEC 40 countries. KIDHU worked ZAICK on 7 Mc. and won the Delaware QSO Party for Connecticut. WHL has a new two-element 15-meter beam. KYQ reports CN handled 378 messages, including 76 on the second session, during 31 sessions. Average attendance was 8.3 stations. High QNI goes to REF, OBR and KIHWF. FHP has a new 44-element 2-meter beam up. EOR, Connecticut SEC, spoke at the Mobileers meeting. HMW won top honors in the Electrical Project Division at the Student Craftsman Fair, recently held in New Britain, with a portable transceiver. The Norwalk AREC held its annual auction May 20. The CQRC held a Roast Beef Dinner May 16. The food committee consisted of JSU, FHP, KNIKEA, KIBSB, KIBJU and KIBMM. AW added 5 new countries for a 189/179 total. KIEEW and his XYL, KNIHLA, have a new NC-300 and a 44-element 2-meter beam at their new QTH in East Hartford. ZPV has a new 22-element 2-meter beam. KIDZI has a new 2-meter final using 820B8. KIAZF is in a new OTH in Manchester. KIGHK moved to New London. K2ESQ, K9BEK and K3DER are active from Trinity College in Hartford. KIGMB, KIJHX and KIBZ are new hams in New Britain. KNIKW is a new Novice in Meriden. EYE is on 420 Mc. CIV wants schedules on 22. FYG has a new kw. final. KICEC and OQC are new OPSs. KNIKPW is a new OES. UED and WPR renewed their ORS appointments. EBW renewed as OPS. Reports received: OO from KIBNQ, MBX and VW; OES from FVV, KIHMU, KLK, LGE and VOL. Traffic: (May) WIAW 354, YBH 324, OBR 272, NJM 173, KYQ 154, QJM 101, TYQ 85, KIWCM 79, HWE 60, WIFJ 55, CHR 50, FHP 49, ROX 45, BDI 43, EFW 42, KICBV 37, GCS 36, WIIOW 32, VTY 33, KIAQE 28, WIEBW 24, KIBMM 21, WISKA 8.

(Continued on page 116)

THE REVOLUTIONARY NEW CENTRAL ELECTRONICS 100V EXCITER-TRANSMITTER

**BROADBANDED! ONLY
ONE TUNING CONTROL,
THE VFO ITSELF.**



CENTRAL ELECTRONICS, THE PIONEER OF AMATEUR SSB IS PROUD TO BRING YOU THE FINAL RESULT OF THREE YEARS OF THE KIND OF PATIENT ENGINEERING, TESTING AND IMPROVING THAT MAKES FOR A SUPERIOR PIECE OF ELECTRONIC GEAR.

MANY OF THE TRIED AND TRUE PRINCIPLES AND FEATURES OF THE ORIGINAL MULTIPHASE EXCITERS HAVE BEEN RETAINED IN THE NEW 100V, ALTHOUGH IN VASTLY IMPROVED FORM. THE USE OF PATENTED BROADBAND CIRCUITRY THROUGHOUT PRACTICALLY ELIMINATES "COCK-PI" TROUBLE.

REGARDLESS OF YOUR PREFERRED MODE OF OPERATION, IT'S ALL IN THE 100V. SSB, DSB, AM, PM, CW and FSK . . . AND ALL AT THE FLIP OF ONE SWITCH. ALTHOUGH THE 100V WILL PROBABLY FIND ITS GREATEST USE AS A SINGLE SIDEBAND SUPPRESSED CARRIER EXCITER-TRANSMITTER . . . NO ONE HAS BEEN "LEFT OUT IN THE COLD" IN ITS DESIGN. THIS IS THE KIND OF A RIG THAT HAMS DREAM ABOUT!

CHECK AND COMPARE THESE FEATURES

STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS - 3.5 to 4.5 Mc. 40 METERS - 6.5 to 7.5 Mc. 20 METERS - 13.5 to 14.5 Mc. 15 METERS - 20.5 to 21.5 Mc. 10 METERS - 27.7 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides on instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on its maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving AB1 or AB2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 3 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C.E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8 3/4" high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

MULTIPHASE 100V complete. Amateur net \$695.00

Orders entered prior to June 1, 1959 will be shipped at the original price of \$395.00

COMING UP! MORE SUPERIOR GEAR FROM C. E. THE SSB PIONEER

A NEW COMPANION RECEIVER: Which will TRANSCIVE THE 100V or separate the two VFO's at the flip of a switch. The 100V has the interlock control sockets built in.

A NEW 2500L BROADBAND LINEAR AMPLIFIER. Big brother to the famous 600L.

A NEW HETERODYNE CONVERTER: To cover all of the 2 and 6 meter bands with the 100V. Interlock control sockets are in the 100V.

SORRY, INFORMATION AND DELIVERY DATES ON THESE NEW ITEMS NOT YET AVAILABLE.

MULTIPHASE

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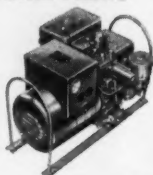
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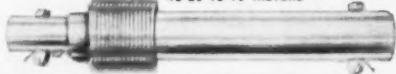
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700 watt (A712) Shpg. wt. 77 lbs.	\$143.50
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F.O.B. factory	
Sizes to 35 KW	
Dual voltage models, automatic controls, etc., available.	

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NEW 60-FT. 4-BAND ANTENNA 40-20-15-10 METERS



Hi-power design. 4 bands in 60 ft. over all. Will handle 2 KW of well over-modulated AM carrier.

40M-C 4 band KW coils.	\$14.95
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FIVE-BAND ANTENNAS

HC-F 5 band KW coils.	\$19.95
HA-F 5 band KW antenna.	33.95
5BC-F phone coils; 5BC-C CW coils.	12.50
5BA-F phone; 5BA-C CW antennas.	27.50

All antennas have

88 ft. KW twinlead, heavy-duty insulators, copperweld wire.

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PRECISION QUARTZ CRYSTALS

For precision frequency control, you can depend on the General Crystal line of high and low frequency quartz crystals. They are available to meet your most exacting and specific requirements. Filter crystals, delay lines, diffraction materials and other special applications designed and produced to your specs. Close tolerance quartz crystal blanks and plates. Transducers for Ultrasonics. Crystal Ovens to give precise frequency control to 1 degree C. Write for engineering assistance and catalog.

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Hams — for crystals of high activity, made of strictly new materials with consistent quality control, order General.

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G4ZU BEAMS

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DX men from all countries laud this completely new precision G4ZU Beam. 52 ohm coax feed direct to transmitter. **NO TRAPS TO SET OR COILS TO BURN OUT.** Each beam preset for maximum operation. **NO ADJUSTMENTS** and rated to the full KW. G4ZU has the only beam improvement to be granted both U. S. and English patents. This dream beam your ticket to **DX UNLIMITED.** \$79.50 and available in the U. S. only at

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KICEC 6, DHU 6, CAK 5, WICUH 5, BFS 4, JZA 3, YOL 3, FPF 1. (Apr.) WJQJ 67.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., WIALP—New appointments: EUT Swampscott as EC, 510U/1 as OO. Appointments endorsed: QVK Sector 1B as EC, YHY Fall River, DPO Chatham, WXP Concord, HLG Stow, VYI Area 1 R.O. as ECs; KIAGS as OBS; OGU as OO. NBT is moving to California. New calls in Groveland: KN1s, KKM and KKN The Cape Cod and Islands ARA held its annual picnic at "Confusion Manor." KIGPH has 30 watts now. The Framingham Club held its election of officers. AWA has a kw. on 75 meters. KN5TEP has gone home for the summer. MIX received a W-Del certificate. ACQ is working all the time. KIBUF has been busy with exams. FRR is building a kw. rig. HIC finally worked out of New England on 6 meters into Indiana. The Great Bay Radio Assn. had a clam chowder party. D. A. Bartol, jr., spoke. KICMS and his whole family attended the Swampscott Hamfest. AVG won a receiver. NF and AAT had a lot of early equipment there. MIX received WNH and WFRS certificates. MEG was named operator of the month in MARS. KIGXD is on several bands in Arlington. KTJ spoke at the QRA. The South Shore Club met. KIJZP is secy. 510U is going to M.I.T. and works at WCOP nights. KH6CJZ/1 is at Otis Air Base. Officers of the Witch City Radio Club are KN1JZ, pres.; KN1KAI, secy.; KN1KAA, treas.; KN1DDF, chief eng. The Brantree Radio Club held its annual banquet. Quincy Trade School has a station on the air and is using the call of Mr. Perilli, the instructor. New officers of the T9 Radio Club are RCA, pres.; JPS, vice-pres.; ISX, treas.; MNK, secy. MNK is back in Beverly after being away for 8 years. OGU has a 75A-4 receiver. Officers of the Neenasket Radio Club in Middleboro are IYD, pres.; LDZ, vice-pres.; KIDJT, secy.; FEC, treas.; HTU, IEE and FEC, directors; KIGPH, public relations. The club met the 1st and 3rd week of each month at 27 No. Main St. YHY, Fall River EC, says they have received some Gonsels for c.d. work. FJJ and KIGRP have net certificates for the Eastern Mass. C.W. Net. OFK is moving to Somerville and has made 221 new contacts on 2 meters in one year. KIHHRM has a new Heath v.f.o. New calls on 2 meters: KN1s KKN, KKSJ, KUC, KKZ, IOC and WIAJA. The Eastern Mass. 2-Meter Net gang held a hunt and picnic in Stoneham. LMZ and KIBRO won the 2-meter transmitter hunt at Swampscott. MUD made 190 new contacts on 2 meters the past year. WXP says his c.d. group still is active with him on 2 meters. KIUCT is active on the nets. Net certificates have been issued for the 6-Meter Cross Band Net to CAS, VYS, HIX HIC, HHV, LMZ, VSV, LOW, EUT, NAD, MBA, K1s AVQ, BSM, GKA, GPH, HPX, IUH, JJD and JME. 2TLL and 8HKZ are working in Framingham. 2TLL/1 is on 6-meter mobile. THUV wants to be remembered to all. LFG is a Silent Key. CMW took a trip to the West Coast and the VE Northwest. His cousin is KN1BRR in Rockport. The SEC appointment is open. Anyone interested, please drop me a line. Traffic: (May) WIAWA 61, KIGRP 517, WIEUT 238, KIDIO 183, WIEAE 176, EMG 143, KICMS 117, ADH 112, WIPX 73, ZSS 66, DIY 44, OFK 36, HGN 35, LMZ 34, KN5TEP 26, KIBUL 24, WIBYL 22, SIV 20, KIGPH 14, GYM 14, WICE 12, GEK 8, TY 8, KYC 7, MIX 7, ATX 6, KIBUF 6, EAV 6, WHIC 6, IBE 6, KIKX 6, WIAWA 4, DTB 2. (Apr.) KIBUF 54, MIX 14. (Mar.) KIBUF 29. (Feb.) KIBUF 84. (Jan.) KIBUF 47.

WESTERN MASSACHUSETTS—SCM, John P. Lindholm, WIDGL—Asst. SCM: Richard J. Kalagher, IKGJ, SEC: BYH, RM: BYR, PAM: MNG. The West Mass. C.W. Net meets on 3500 kc. at 1900 Mon. through Sat. The Mass. Phone Net meets daily on 3870 kc. at 1800. The West Mass. Novice and Slow Speed Net meets Tue., Thurs. and Sat. on 3744 kc. at 1830. At this writing there appears prospects for the formation of a West Mass. 6-meter net. Let the SCM know your feelings on the subject. Technicians, take note. EC endorsements go to OY, SPF and TAY. SPF, Worcester EC, is calling for Severe Storm Weather Reporting Stations to assist in detecting the birth of tornadoes in the Worcester Area. Contact SPF or your SCM. KIGCV has a new HQ-143. LVL, KRU, KICR and KIJH, of the Gardner Area, are building 6-meter mobile rigs. Your SCM was fortunate to be able to attend the Massachusetts Convention and enjoyed meeting many of you. KIDWU has a new Johnson Challenger. KICTL latched on to UQ2AN on 14-Mc. c.w. Your SCM was presented at the June banquet of the Hampden County Radio Assn. I enjoyed meeting the Springfield gang and hope to get to visit the other clubs in the fall. In May the Massachusetts Phone Net had an average QNT of 18 stations with an average of nine messages handled per session. The average duration of the net was 75 minutes. Outlets are needed from Pittsfield, North Adams, Orange and Wil-

(Continued on page 118)

MORE THAN CITIZENS' RADIO . . . a complete, fully engineered "industrial-type" transceiver!



Anyone can operate...no code to learn...no examination necessary...license issued by the FCC on request!

- Complete Class "D" (27 Megacycle) Citizens' Band coverage—your choice of 5 channels at the flip of a switch!
- Meets all FCC requirements
- Maximum legal power
- Push-to-talk microphone!

"More than just 2-way Citizens' Radio equipment"—the Viking Messenger is the very finest personal communications equipment available in the field! Designed for reliability and easy installation in your home, business location, car, truck, or boat. Excellent receiver sensitivity and selectivity. Built-in Squelch, Automatic Volume Control, and Automatic Noise Limiter. Compact, modern styling—only 5½" high, 7" wide, and 11¾" deep. Complete with tubes, microphone, and crystals for one channel. 3 models available: 115 Volts AC, 6 Volts DC and 115 Volts AC, or 12 Volts DC and 115 Volts AC.

Manufacturers of the world's most widely used personal communications transmitters

Write for FREE color brochure with specifications and complete information on antennas and accessories!

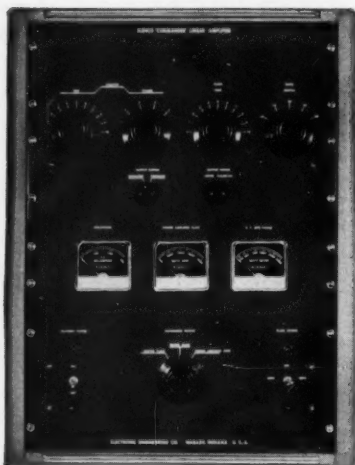


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Although designed to commercial specifications, the Elenco Commander operates with excellent efficiency at the legal amateur power limit of 1 kw average d.c. input. Working well within its rating, the amplifier gives superior performance on five amateur bands, 10 through 80 meters.

ELENCO "POWER GAINER"

Audio Compression
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- 4 Times Power Gain,
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New factory-to-consumer sales plan (direct sales only) includes trade-ins, time payments, money-back guarantee.

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Manufacturers of
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liamstown. The West Mass. section includes Worcester, Franklin, Hampshire, Hampden and Berkshire Counties. All other counties are in the Eastern Mass. section. Your SCM is assuming duties at League Headquarters, thereby creating a vacancy for the SCM position. See the election notice in "Operating News." Traffic: WIAJX 90, DGL 78, BUR 77, DNS 74, ZPB 27, QKC 26, AGM 19, OSK 9, KIGCV 4.

NEW HAMPSHIRE—SCM, Robert H. Wright, WIRMH—SEC, BXU. RMs: KIBCS and KICIF. PAM: IIQ. V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Fri., and at 0900 Sun., on 3842 kc. The NHN (c.w.) meets nightly at 1830 on 3685 kc. The Northeast V.H.F. Net convenes nightly at 1930 on 143.8 Mc. The N.H. RACES Net meets Sun at 1300 on 3993 kc. and 53.350 Mc. Please note the earlier meeting time of the N.H. C.W. Net. New Hampshire has lost another old-timer in the passing of ITF of Northwood. The GSPN picnic held May 24 was well attended despite the cold weather with about 60 members and their families showing up. It was held at Lake Shore Park in Gilford on the shore of Lake Winnepesaukee. The Manchester Radio Club announces plans are being made to sponsor a N.H. Hamfest next year. TA received a certificate of merit for perfect c.w. copy of the Armed Forces Day message. Welcome to new ham KNILAS. Louise French, of Heniker. PZI and VAU are both employed at the Sprague Electric plant in Concord, and RMH is employed at Aerotronics Associates in Hopkinton. MDP and YHF are equipped for RTTY. Traffic: (May) KIBCS 624, CIP 514, IIR 128, WITA 70, QGT 58, EVN 17, KIBOO 16, WYHF 12, AIJ 11, KIDKD 10, WICUE 2. (Apr.) WIHKA 16.

RHODE ISLAND—SCM, Mrs. June R. Burkett, WIVXC—SEC, PAZ. PAMS: KCS and YRC. RM: BBN. ZPG is the new president of the CRA. Other officers elected at this club's annual election on June 4 are KIEGH, vice-pres.; KIEBM, secy.; and POP, treas. At a recent election of officers at the BCRA, MUL was elected pres.; NQH, vice-pres.; KIKLQ, secy.-treas.; and SJL, act. mgr. VBR is a new member of MARS. BBN reports that a new Novice in Portsmouth is KNIRRV. KIHZE is building a transistor 10-meter receiver. SMU, manager of the RIN, has earned his BPL medallion. It was previously reported that the WRI Award, sponsored by the ARASNE, would be given to applying stations with confirming contacts with two stations in each of the five Rhode Island counties on or after Jan. 1, 1959. This date was in error and should be Jan. 1, 1956. Traffic: (May) WISMU 535, LQJ 59, TXL 37, VBR 28, YRC 19, BBN 17, WED 12, KIHZE 10. (Apr.) WIBBN 32.

VERMONT—SCM, Harry A. Preston, jr., WIVSA—SEC, EIB. RM: KIBGC. PAM: ZYZ. Asst. PAM: KIGLO. Frequencies used in Vermont: C.W. 3520, phone 3855. VTN meets Mon.-Sat. at 1830 (c.w.). VTPN Sun. at 0900 (phone). GMN Mon.-Sat. at 1700 (phone). VEPN Sun. at 1700 (phone). New calls are: KNKPO, Manchester, and KNKVN, Newport. The following Vermont amateurs were seen at the Swampscott, Mass., Hamfest: KIBSN, KIAUE, DAP, ZEW, KIGBF, KIGBE, KICGB and VSA. ETE has plans for a new addition to the house with a new shack. EXZ has completed the low-power 220-Mc. transmitter and is using an 832 final. The International Field Day and Vermont Hamfest will be held Aug. 8-9 at Clarey's Rayside, Mallets Bay, Vt. The following are equipped with RTTY: BXT, EOY, TBG, WEW, KIAUE and VSA. On Labor Day week end the ARRL New England Division Convention will be held and HDQ advises there will be something for the SW (Sweet Wife) and chartered buses for a tour of ARRL Headquarters. Traffic: WIELJ 45, HRG 45, AZI 33, KIBQB 33, WIKJG 14, KIGBF 8, GBE 6, WIZWN 2.

NORTHWESTERN DIVISION

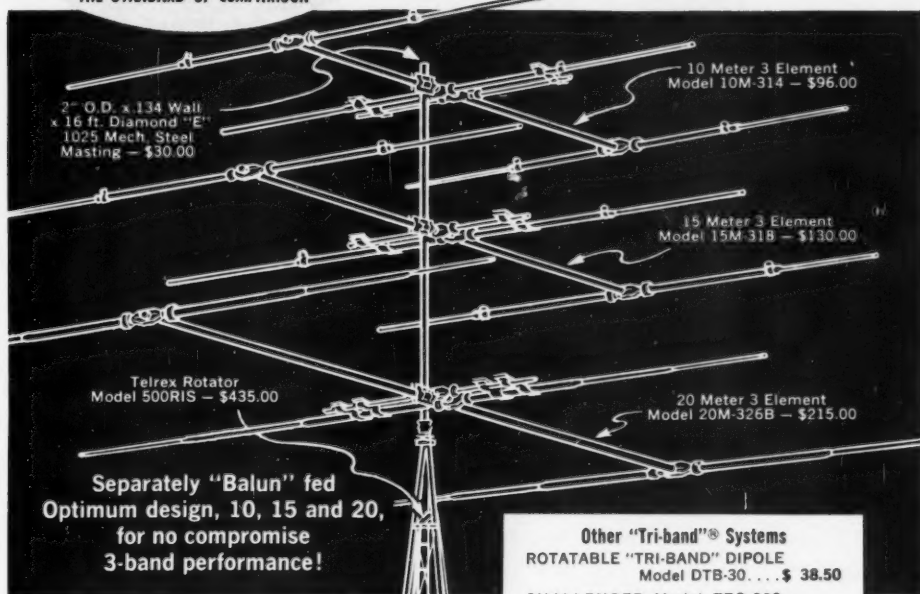
IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The WIMU Hamfest will be held at Big Springs, Idaho, July 31, Aug. 1 and 2. Hope to meet you all there. The Idaho Radio Amateurs elected K7BJK, pres.; and Clifton E. Hunt, secy.-treas. Hope they get Ham Hill News back in circulation. GHT is chairman of the Miss Idaho Pageant. UKH and GCO are going s.s.b. 6GTJ/7 and K7GQE are looking for 6-meter contacts. WEY and WEZ have a new son. JFA has a new grandson. K7CXP and K7ENE dropped the "N." New OM's are K7s HNS and IKR; new YLs are K7s HWL, HWG and HWJ all of Lapwai, thanks to K7BWV's training. IWU built a portable rig for Field Day. DPD has an all-band vertical with a v.h.f. ground-plane on a 40-ft. mast. LQU vacationed in Canada and had eyeball QSOs with VETWL and VETADR. Traffic: (May) W7VQC 32, K7BWV 27, W7GGV 5, K7GHX 2, W7IWU 2. (Apr.) K7BUY 20, W7GHT 14.

(Continued on page 120)

"WORLD'S FINEST" AND MOST PRACTICAL 3-BAND SYSTEM

telrex "CHRISTMAS TREE"

"THE STANDARD OF COMPARISON"



Separately "Balun" fed
Optimum design, 10, 15 and 20,
for no compromise
3-band performance!

"Beamed-Power" "Balanced-Pattern"

By far the most powerful and practical 3-element "Tri-band"® System . . . guaranteeing no compromise, 3-band performance, and reliability — rain or shine! "Balun" fed and optimum antenna design assures . . . maximum gain, and impedance bandwidth, plus pattern symmetry with minimum TVI, BCI and harmonic radiation qualities—not possible with so-called "Tri-banders." Install Telrex "Tri-band - Christmas-Tree" for "top-man-on-the-frequency" results!

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"Tri-band"
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ROTATABLE "TRI-BAND" DIPOLE Model DTB-30 . . .	\$ 38.50
CHALLENGER Model TBS-308 "Tri-band", 2 elements on 10, 15 and 20 meters	\$ 99.50
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Leakproof
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America's Favorite
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BURGESS BATTERY COMPANY

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100V TRANSMITTER
IN PRODUCTION

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Also the Complete **CENTRAL ELECTRONICS SSB line**
600L LINEAR AMPLIFIER — Powerful, Silky Smooth
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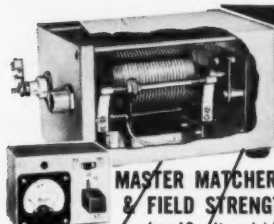
MM2 "scope with adapter — tells all about your and
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● National Receivers, Teflex Beams, CDR Rotators
SAVE MONEY BY MAIL: Write for Bulletin "Getting
Started" and "Stepping Up" in SSB. Give call letters.
(Order from W9ADN at

ORGANS & ELECTRONICS Box 117, Lockport, Ill.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI
—SEC: KTH, PAM: EOL, RM: KGI, MPN meets
M-W-F at 1900 on 3910 kc, MSS meets T-T-S at 1900
on 3530 kc, FLT was honored as the outstanding stockman
of Montana and received an Honorary Doctor of Science
Degree. ZUQ and YIO have a new baby girl. There were
110 registered at the Central Montana Hamfest at Lewis-
town. KN7HWN won a G66B. K7AEZ and YHS made
BPL. YHS earned a BPL medallion. MKB and YHS
passed the Amateur Extra Class exam. New calls:
KN7HWK at Cut Bank; K7EGI, K7EGL, K7EGM and
K7EGN at Flaxville; KN7IEX at Livingston; K7ICM
and K7ICN at West Yellowstone; and KN7IHA at Cor-
vallis. K7BON moved from Hardin to Billings. IUM
moved from Libby to Ekalaka. WAW moved from Bil-
lings to Denver. VNE moved from Billings to Worland.
Wyo. The Electric City Radio Club and the Harlo
Radio Club made the ARRL Affiliated Club Honor Roll.
K7BWS has a new Heathkit Cheyenne Mobile and is
working near Dillon. Traffic: W7YHS 146, K7AEZ 136,
EWZ 62, BYC 28, DVZ 16, AWD 4, BVO 4, W7NPV 4.

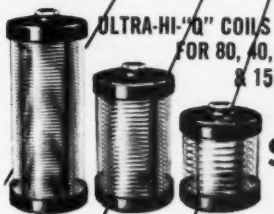
OREGON—SCM, Hubert R. McNally, W7JDX—
EZH reports meetings of AREC twice per month on
29.6 Mc. K7EPO is working out well now with his DX-40
after some trouble. The Southern Oregon Radio Club
furnished communications for the Memorial Day Bonfire
on Rouge River. KEN, DXY, CPV, CME, AHP, DEM,
BJO, YUV, CUS, KZU, K7ACB, K6UVC/7 and
K6UVD/7 took part. DIC still is making flying trips to
Portland. K7CNZ is a new ORS. The Portland v.h.f.
group was active during the recent National Alert.
Those working were GLZ, KY, OZL, GWB, NGW and
ALG. The Oregon BPL gang increased during May with
ZB, BDU and K7ULL making the big totals. ZB is
about to lose his 80-meter antenna because of highway
work. The Portland v.h.f. group also was out during the
recent earthquake test and made another good showing.
About fifteen 6-meter mobiles responded in 30 minutes.
SNA has a new Windom beam, also a brand-new
DXCC certificate. A nice report was received from
K7DRS. UZU has moved from Roseburg to Forest
Grove. A good report was received from K7GZB. The
SEC, UQI, continues to report progress in AREC mem-
bership and activity and definite plans have been made
for the proposed AREC net on 3875 kc. OSN still is
going along in great style, with good check-ins and
traffic reports for May. The Clackamas County gang
furnished communications for an evacuation caravan dur-
ing the recent Alert. K7ADX, GNC and UQI led the
gang. Traffic: W7ZB 749, K7CLL 661, W7BDU 602,
RVN 118, ZFH 83, GLZ 36, K7CNZ 42, W7AJN 34,
DIC 31, OMO 24, LT 17, DEM 14, K7EPO 10, W7EZH
4, GNC 4.

WASHINGTON—SCM, Robert B. Thurston, W7PGY
—SEC: PQT, RM: AIB, PAMs: LFA and PGY. Wash-
ington nets: WSN, 3535 kc., 1900 PST Mon, through Fri.;
WARTS, 3970 kc., 1830 Mon, through Sat.; NSN, 3700
kc., 2100 PST Mon, through Sat. PWA is the new man-
ager of NSN. RGL has suspended Official Bulletin trans-
missions until Sept. 1. DDL and his XYL, DAV, have a
new Collins 8-line station. WDM is sweating out DXCC.
BA, PGY, DPW, QLH and DZX made the BPL col-
umn. The Spokane Radio Club ended 18 weeks of code
and theory classes on May 29 with twelve members tak-
ing the license examination and passing their tests. LFA
is working on a Tri-band quad. AIB has a new Valiant.
JEY is attending summer school in Colorado. FIX and
his XYL were on vacation during the month of June.
OLH received confirmation as manager of RN7 on Apr.
27 and had visits from the SCM and DZX. IGF is start-
ing a class for Novices in White Salmon. The Grays Har-
bor Amateur Radio Club now has 42 members. AMC is
working on a new keying technic for Harvey Wells.
OIV lost the power transformer in the Globe King.
Pierce County C.D. Net drills will be suspended for the
summer and reconvened the 1st Sun, following Labor
Day. OEB received a sticker for 35 w.p.m. from 60WP.
MPH moved to Seattle. DOB is back on the air after a
bad session with the receiver. IST worked on 220-Mc. gear
for the V.H.F. Party. UMJ is active on 2 meters. CMQ
is using a kw. rig for a sked with his son in Alaska.
K7EEF has a new RME-4350A. K7IHX is a new call
in the Tacoma Area. K7HFT is a new General Class
licensee in the Vancouver Area. ZNN won a gold cup as
Amateur of the Year from the Spokane Radio Club.
EHH is using a DX-40 to drive the new linear. K7BEO
is a new Asst. EC. A new net called CBN is the Co-
lumbia Basin Net and meets each night on 3960 kc. at
2000 PST. Its purpose is traffic and contacts. A new
Novice in the Renton Area is KN7IAF. ULK is leaving
for an extended vacation out of the country. IEU and
IGF are new ECs. OEB renewed his ORS appointment.
EVW renewed as OPS. GFM has a new 32-S exciter.
About 200 hams attended the Bremerton Hamfest. JPH
is trying out a new Hallcrafters 101 receiver. OIV re-
placed MPH as EC for the Puallup Area. Traffic:
W7BA 2772, PGY 1461, DPW 701, QLH 553, DZX 509,
(Continued on page 122)



**MASTER MATCHER
& FIELD STRENGTH METER**
6 or 12 volt models **\$24.95**

Automatically
tunes entire
band by re-
mote control.



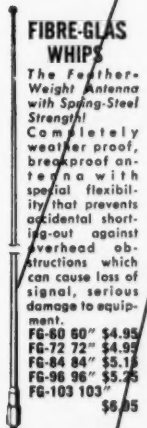
ULTRA-HI-"Q" COILS
FOR 80, 40, 20,
& 15 METERS
Your
Choice **\$5.95**

The coil with the highest "Q" ever obtained.
Tested and found to have a "Q" of well over
515. Use with 36" base sect. 60" whip. 3" Dia.



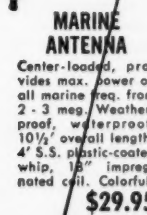
**3 ELEMENT 11M. BEAM
NO. SR-500**

Provides a power gain of
approx. 2 1/2 (9dB)
in forward direction.
10 to 1 interfe-
rence reduction from sides
and rear. VSWR 1.1 to 1 at band
center when fed with 52 OHM coax. . . **\$36.00**



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WHIPS**

The Feather-
Weight Antenna
with Spring-Steel
Strength!
Completely
weather proof,
breakproof ant-
enna with
special flexibil-
ity that prevents
accidental short-
ing-out against
overhead ob-
structions which
can cause loss of
signal, serious
damage to equip-
ment.
FG-60 60" **\$4.95**
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FG-84 84" **\$5.15**
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FG-103 103" **\$6.05**



**MARINE
ANTENNA**

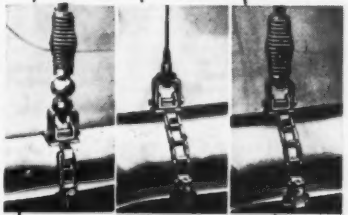
Center-loaded, pro-
vides max. power on
all marine freq. from
2-3 meg. Weather-
proof, waterproof.
10 1/2' overall length,
4' S.S. plastic-coated
whip, 16" impreg-
nated coil. Colorful.
\$29.95

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BAND ANTENNA**

40" base loaded
S.S. whip antenna.
Fitted with a 1/4"
dia. brass slug for
use with a stand-
ard-broadcast 8-
ball type cowl
mount, also roof-
top or trunk lid
type mount. Low
standing-wave ra-
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band when fed
with a 52 ohm
coax.
8B-27 **\$12.95**

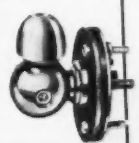
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LAYDOWN
MOUNT**

Can be mount-
ed in any posi-
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able swivel for
all positions.
Chrome-plated
brass, water-
proof phenolic
insulator.
\$19.95



BUMPER MOUNTS

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Adjustable to any bumper. No holes to drill.



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VSWR under 1.5:1
at resonance. Com-
plete with 50' RG
58/U Cable. Swivel
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base for flat or
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installation.
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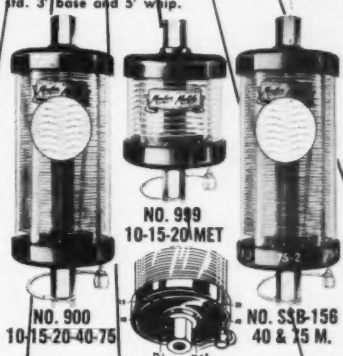
**SWIVEL-BODY
MOUNT**

Smaller version of
Master Mobile Mount,
less spring. Swivel
mounts in all positions.
3/8"-24 thread for
Magic Wand, and all
Master Antennas.
No. J-11 **\$2.95**

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MULTI-BAND ANTENNA COILS

New Plug-in type coils, designed to operate with
std. 3' base and 5' whip.



NO. 999
10-15-20 MET
NO. 900
10-15-20-40-75
NO. SSB-156
40 & 15 M.

• Rigidly tested & engineered—found to have
"Q" of 525 • Handles 500 Watts input
• Operates into a 52-ohm cable • Positive
contact—noise free, troublefree operation
• Weathersealed • Factory pre-tuned—no ad-
justments needed. **YOUR CHOICE EACH \$14.95**



**NEW!
SLIM-JIM**
ALL-BAND
BASE LOADING
ANTENNA COIL

96" WHIP

FOR 10, 11,
15, 20, 40, 80
METERS
SIZE
3 1/2" x
1 1/2"
NO.
B-1080

Positive action,
just slide whip
in or out to
loading point
and lock nut
into position.

\$17.95

**MASTER-MAGIC
WAND**

New easy-to-install, sin-
gle band, top-loaded
plastic covered fiber
glass antenna provides
maximum performance
at the most useful ra-
diation frequencies.

- 10 Met.- 5 Ft. L. **\$8.95**
- 11 Met.- 5 Ft. L. **8.95**
- 11 Met.-35 In. L. **8.95**
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**SUPR HI-GAIN
CITIZEN BAND**

Stacked coaxial
antenna provides
5-6 db gain.
42" high from
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Furn. with 12"
ext. for bumper
mount.

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\$21.95

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CATALOG OF COMPLETE
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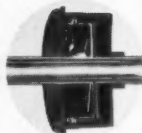


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Over **12,683** * in Use!



The Hy-Gain Innu-Trap acts as an insulator at resonant frequencies, but allows radio energies of other frequencies to pass, making the Innu-Trap an automatic electronic switch which isolates various sections of the verticals to make them the proper length for each band. Exclusive adjustable capacitor plates are used, individually factory resonated for efficiency in high degree. Traps are completely weatherproof and airtight. Carbon activated polyethylene cover and cap. Traps rated to take full maximum legal input power. Just 2x3", trap's weight only 8 oz.

The Self-supporting Hy-Gain Multiband Trap Verticals are completely factory pre-tuned with no further adjustment necessary, maintaining an SWR of 2:1 or less across the entirety of each band for which they are designed. 52 ohm coax feed line. True $\frac{1}{4}$ -wave marconi resonance on each band makes possible low angle DX radiation pattern. All top-grade construction throughout. Model LC-80 Loading Coil (\$4.95) adds 80M operation to the 14-AV Vertical. Decoupling stub (\$4.95) adds 0M operation to both models 12 and 14 AV.



Filter Glass Impregnated Nylon Base Assembly makes possible self support. Heavy cast aluminum mounting bracket is adjustable for various sizes of mast. Weather-proof internal coaxial fitting supplied.

12-AV Vertical

for 10, 15 and 20 meters:
only 13.5" high, wt.: 12 lbs. Self supporting.

Combination mast & radial
roof mounting kit, complete, \$8.95.

\$19.95

14-AV Vertical

for 10-40 meters: 21" high;
wt.: 13 lbs. Includes exclusive Hy-Gain Capacity Hat.

Combination mast & radial
roof mounting kit, complete, \$9.95.

\$27.95

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APN 189, HUT 165, K7ABB 156, W7OEB 150, AMIC 79, AIB 43, IEU 35, OIV 35, HSC 32, K7AJT 28, GNA 19, W7EHH 17, K7CHD 14, W7LFA 11, IGF 9, UWT 7, YFO 7, EKT 6, JC 6, EVW 4, FRU 4, CZY 3, JEY 3, KZ 2, REC 2.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—The Pacific Division Convention, to be held in Honolulu Aug. 15-16, is sponsored by the Honolulu Amateur Radio Club. A visit to Wake Island revealed the following KW6s all within a radius of two city blocks: CB C.J., CM, CP, CQ, CS, CU, CV, CX and Novice WV6CW. KW6CGA is Net Control Station of the Pacific Net. This traffic net meets nightly at 0700Z on 14.240 Mc. KW6CE has moved to Guam, still with the F.A.A. KH6AUM, EC for Maui, reports 16 full and 14 supporting members in the AREC. KH6AJF is back on the active list. KH6DBI reports into the NTS regularly and will accept local traffic for the mainland. KR6FT is up on s.s.b. The operator is Frank Tate. Traffic: (May) KH6AJF 394. (Mar.) KH6DBI 174. KR6FT 94. (Feb.) KH6DBI 169. KR6FT 60.

NEVADA—SCM, Charles A. Rhines, W7VIU—New officers of the NARA are PC, pres.; UVZ, vice-pres.; K7DEF, secy-treas.; K7AGZ, sgt. at arms.; MAH, dir. MAH was on from Mt. Davidson for the V.H.F. Contest. SRM has installed Gonset Communicators in all Reno hospitals as a tie-in with the c.d. for disaster work and is now busy training operators for restricted radio-telephone licenses. VIU visited at the May meeting of the SNARC and heard an interesting report by VLIH on PRP. He has a new final now—parallel 4-250As. JU visited the Arizona gang at the Whitehorse Lake outing. JCY graduated from high school and now is in the Army. K7AHA has push-pull 813s in the final. BFM is attending summer school at the U. of Nevada and hopes to graduate to General Class soon. The NVN meets on 3660 kc. at 1900 PDT now. We still need better coverage in some parts of the State. Traffic: W7VIU 60.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYN—Asst. SCM: Frank J. Pacier, W6VMY. SEC: W6NVO. PAM: W6ZLO. RMS: W6PLG and K6EWY. W6VIL gave a fine talk on the ARRL-IGY Propagation Research Project before the Monterey Bay RC on May 29. It was very well received and we are happy to welcome Mason to the section during his sojourn at Stanford where he is continuing the project. At the same meeting W6HC gave a brief résumé of the Board Meeting. The San Mateo RC Hamfest was held June 7 with a big turnout estimated at 400, plus XYLS and jr. operators. There was a unique and interesting display of old-time gear. W6PBC has completed an "all-band receiver" (28 Mc. and higher). W6QIE repaired the communications trailer inside and out and added new operating positions. W6DEF still has to install the mobile in the new Rambler station wagon. K6GZ missed making BPL for the first time in over two years. Bob passes NCN traffic with K6DMW via RTTY Wednesday nights. W6OWP reports FB RTTY contacts with CE3AGI, ex-W6YQB. W6CLT was temporarily QRT because of a field trip. K6EQE now is being heard on the phone bands with a new DX-100. W6EFL has a new DX-20. New appointments are K6TEF as OPS and W6BMD as ORS. Traffic: (May) W6RSY 601. K6DYN 347. K6GZ 142. W6YBV 136. K6HGV/6 97. W6HC 65. W6DEF 62. W6ZLO 51. W6FON 37. W6OIH 32. W6YHM 30. K6YKG 23. W6RFF 19. K6TEH 4. (Apr.) K6HGV/6 104. W6PLG 48.

EAST BAY—SCM, B. W. Southwell, W6QJW—Asst. SCM: Mary Gwynne, W6PIR. SEC: K6DQM. ECs: W6LGW, W6ZZF, W6UZZ, K6EDN and K6JNW. W6CAN has resigned as SEC. Thanks for an FB job, Wayne. K6DQM is the new SEC. His QTH is 210 Castle Hill Ranch Road, Walnut Creek, Calif. K6GK is QRL a new QTH. K6QHC is stationed at Treasure Island Electronics School. His new Triband beam is 56 feet up and he also has a new NC-300. K6OSO is rebuilding. The Berkeley QRMers had a picnic meeting. K6ZYZ is QRL NCN traffic. K6DMW is on RTTY traffic. K6OKK is on u.h.f. experimental. New officers of the Skyriders are W6KSP, pres.; W6ACN, vice-pres.; W6BSY, secy.; the NYL of W6ELP, trans. W6AKB is on 21-Mc. phone. K6ZBL copied the Armed Forces Day message on RTTY. K6JIT worked W7CYQ on 30 Mc. with a ground plane and 25 watts and has a new 50-Mc. beam. EBRC saw a demonstration of microwave equipment and cross polarization. The Bands-panners ARC hosted the CCRC. K6ZYZ is on all bands with a DX-35 and a 75A-4. W6FFQ is a new Novice in Hayward. The HARC has a 7.5 kw., 115-v.a.c., 60-cy. portable generator. The MDARC was active on Field Day. W6WJN has become a Silent Key. K6TPO received his CP-15 award. K6DEJ has a new Gonset DSB-100. W6EIT is a new Novice in the MDARC. The W6HMQ family has a new YL harmonic. W6BEP is going mobile. W6QJW is mobile on all

(Continued on page 124)

Transistor Power Supplies* and Components

* Complete Units

D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

Size: 4 1/4" x 3 1/4" x 1 1/4" Wt: 10 oz. 6-V or 12-V Input: **\$39.95** 24-V Input: **\$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermitent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4 1/4" x 3 1/4" x 1 1/4" Wt: 14 oz. 12-V Input: **\$37.50** 24-V Input: **\$79.50**



Toroid Transformers for Transistor Power Supply Application

H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped... 450 and 225 VDC from bridge rectifier... 45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 55 watts.

H-28-450-13 Input: 24/28-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 65 watts.

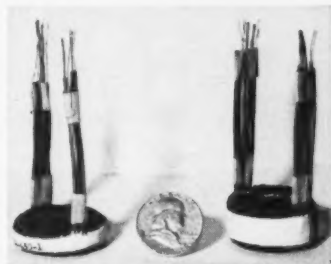
H-6-100-123-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-123-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-123-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **\$16.00 ea.**

With Encapsulation (3 ozs.). 1-10 units: **\$18.50 ea.**



HD SERIES - 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$18.50 ea.**

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$21.50 ea.**

HDS SERIES - 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$31.50 ea.**

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$34.50 ea.**

400 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

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bands, W6TT has a DX score of 284/283. W6OJW has worked 103 but is sweating out his 100th card for DXCC. Traffic: (May) K6GK 265, K6DMW 74, K6ZY 42, K6ZBL 37, K6OSO 23, W6JOH 4, K6QHC 4. (Apr.) K6DMW 163.

SACRAMENTO VALLEY—SCM. Jon J. O'Brien, W6DDO—Asst. SCM; William Van de Kamp, W6KV, RM; W6CMA, PAM; W6ESZ and W6VY. New appointee: K6PWA as OES. The North Hills Club's new officers are W6GHE, pres.; K6IGG, vice-pres.; W6QYJ, secy.-treas.; W6ZOH, activities; and K6IS, custodian. The NHRC Net meets Thurs. at 2100 PDT on 29 Mc. Another new club in the Sacramento Area is the American River JC ARC, sporting such equipment as a new KWS-1, two Gates transmitters and Millen 6- and 2-meter high-power gear. The SARC has the call W6AK. W6AF built a 30-watt 14-Mc. rig for Field Day and uses it to drive his kw. to work DX. He now has 101 countries confirmed. K6ENL is the proud possessor of an A-1 Operator Club certificate. W6YKU worked diligently on a DX-100 for Field Day. W6OJB and K6AWH had a contact on 10 mc. W6ZF gave a talk to his son's third-grade class on communications and demonstrated amateur radio by contacting K6HHD and K6PWH on 2 meters with a Communicator right from the classroom. W6ADGH had her Gen. Cl. ticket four days before telling OM W6GTG and finally had to send him on an errand in the mobile so she could tell him on the air. K6ENK, K6ENL and K6PWH were among the 75 YLs who had a marvelous time in Santa Barbara on May 23. The Camellia Capital Chirps are making plans for a YL get-together in Sacramento next March. Traffic: (May) K6SXX 83, W6CMA 58. (Apr.) K6YBV 550.

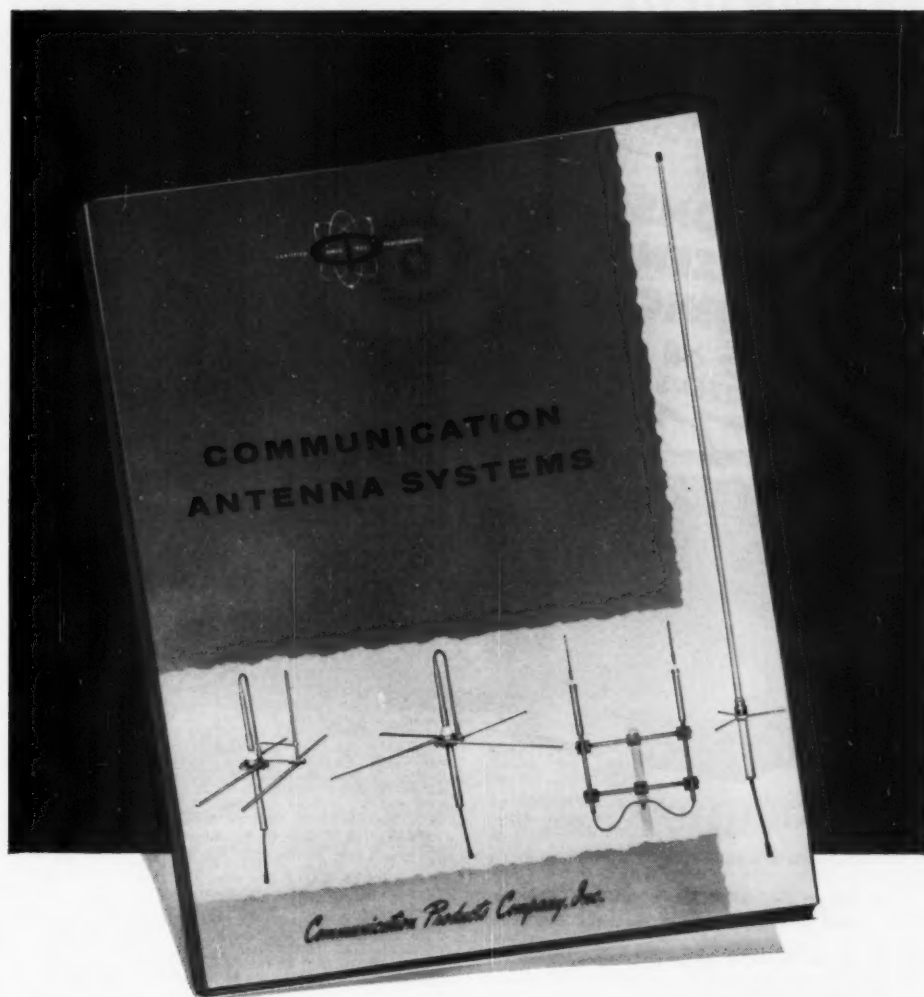
SAN JOAQUIN VALLEY—SCM. Ralph Saroyan, W6JPD—SEC; W6BL, EC; K6BGO, PAM; K6EJT, K6CPQ made BPL. The Madra gang is going to host a San Joaquin Valley Section Picnic at Bass Lake Sept. 27. Please contact K6EJT for registration. W6QFR was hurt in a traffic accident and was fortunate to have W6SQP come on the scene to give Ted the needed first aid. The Downey Radio Club operated in Alpine County and made over 40 contacts. The Tulare County Net meets every Sun. at 10 a.m. on 3.9 Mc. The Fresno Mobile gang held a picnic at Mooney's grove in Visalia and 40 showed up for a bang-up time. In May the S. J. V. Net had 25 sessions, 333 check-ins, 40 messages, 24 QSTs and 30 contacts. The Tulare County Radio Club is looking for contacts on 50.58 and 147.6 Mc. at 8 to 10 p.m. the 1st Wed. of each month. W6NQM has been fortunate enough to be appointed to the Air Force Academy in Colorado. He will be operating from K6MIC when time permits. K6OGX and W6QJM are on 220 Mc. K6LJL has worked 67 countries on s.s.b. K6PBL is on 6 meters. W6AGG is running a Ranger on 75 meters. K6LVE had a surprise baby shower. W6EBL has a kw. Matchbox and runs 140 watts. W6LJK got an HT-32A. Ex-W6GEG is now W6GJR in Greensboro. N. C. W6JPS is conducting code classes on 50.850 Mc. from 5:00 to 5:50 p.m. daily. K6IXA is heard on 75 meters. Traffic: K6CPQ 529, W6TSV 56, K6EJT 50, W6NQM 10, K6SMZ 10, W6ARE 8.

ROANOKE DIVISION

NORTH CAROLINA—SCM. B. Riley Fowler, W4RRH—SEC; HUL, PAM; DRC, V.H.F. PAM; ACY, RM; PNM. I understand from those who attended that the Charlotte Swapfest was an excellent meeting as always. Sorry the SCM could not be present. BAW sends a very good report. Those boys have an excellent AREC-RACES program going. Both nets have not missed a session in two years. Catawba County reports splendid activity on both 2 and 6 meters for the AREC-RACES nets. Lincoln County has secured some valuable equipment for RACES. AMY is now on RTTY both MARS and ham-band operation. BBZ is preparing to operate RTTY. EDU has a machine but as of the date has not begun operation. Burke County has switched over to 2 meters for AREC-RACES. There is liaison with Madison County. CVU; Gaston County, HQF; Lincoln County, AMY; Catawba County, FUS; Caldwell County, WID, and Forsyth County, RNG/4. K4SWN reports good openings on 6 meters to Cuba and as far west as Oklahoma. GXR reports good activity in Buncombe County on AREC-RACES. MARS in the State has moved to 5217 kc. (Army). Check the frequency for excellent procedure. Traffic: W4BAW 110, RRH 39, ROB 31, BBZ 10.

SOUTH CAROLINA—SCM. Dr. J. O. Dunlap, W4GQV—SEC; K4PJE, RM; AVU, PAM; IIE, K4UY and UYX are headed for Okinawa and will be looking for contacts back home. CNZ is transferred to Cocon. Fla. Notes on the Charleston Hamfest meeting: TWV states that the S.S.B. Net has increased from 16 to 100 members; a traffic award was presented to FHL, who in turn presented it to K4TKS; the Charleston

(Continued on page 120)



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Club challenged Columbia for the "Corn Cob" Field Day Trophy; PAM K4LIE held a meeting of NCSs and alternates of the S.C. Fone Net to discuss new operating procedures; SEC K4PJE spoke on the value of AREC; ZRH on RACES, ARC and GQV on ARRL affairs and the forthcoming World Conference. CAL finally has received his long-desired net certificate. ZRH's EC appointment has been renewed. VPN is back from Newfoundland. K4VIA has his Conditional Class license. RM K4AVU and Net Manager GAT are commended for their 1st issue of S.C.-C.W. Net News. S.s.b. handled 71 formal messages in May. The Columbia Hamfest will be held Aug. 2. Pawleys Island Sept. 12-13, and Rock Hill Oct. 11. The Green and Greenwood ARCs are newly affiliated with ARRL. The Blue Ridge Radio Society and Greer ARC are planning a hamfest this fall. Traffic: (May) K4GAT 278, W4AKC 248, K4AVU 162, WCZ 110, VVE 74, PIA 70, W4FFH 68, CJD 53, CHD 43, K4IVI 39, W4GQV 23, K4LNI 19, W4QCC 19, K4LIE 9, W4CNZ 8. (Apr.) K4IVI 5.

VIRGINIA—SCM, John Carl Morgan, W4KX—VFN meets on 3835 kc. at 1900 daily; VSN (slow net) on 3680 kc. 1830 M-F; VN on 3680 kc. at 1900 daily, all EST. VSN is successfully surviving the summer doldrums for the first time. K4MJZ has been appointed SEC for Virginia succeeding PAK, who found it necessary to resign. Our sincere thanks to Hack for his fine job. We know you'll give Tex your support. LW reports he's pulling the main switch for two years while on duty in London. Dick will be missed on VSN. MXU is QRD Turkey; K4VKE, of Quantico's PFC is now in Japan and peripatetic CVO still is all over the map. The college and high school crowds are more active with the parole from studies. Congrats to K4RBQ, valedictorian of his high school class, and to K4ZKW, who won a big scholarship in Agriculture in his. Proof again that ham radio and good school work can be completely compatible. Welcome to K8MIE, now 4GWP in the Winchester Area. BGP is nobling in a 33-ft. boat. K4HIP used one week of vacation to assemble the new DX-100B. K4HIA made 28 QSOs on the first 2 nights with the new RTTY rig. OOL de-mothballed the Viking II and thereby QROs by about 900 per cent. K4VWK made General, worked his first DX and now has the rig on 80 meters for nets. K4MJZ suggested 26 new countries in May. A card from the Willamantic Conn. Jaycees reports ORT has won the W-Conn. C.W. Award. There was much activity in the Richmond ARC's May Round-up which even found BZE on phone! CXQ now has 80-meter WAC confirmed. The Roanoke Hamfest was a whopping success, even if the best your SCM could do was to tie with CHK as winner of the left-foot sending contest. Traffic: (May) W4PFC 1037, QDY 435, SHJ 342, K4AET 304, QES 256, MJZ 157, JKK 118, W4RHA 94, K4KAP 71, W4MXU 37, PRO 51, OOL 43, K4TFL 35, W4BGP 29, BZE 28, K4HIP 26, W4KX 23, W3MGL/4 12, ATQ 11, K4MEV 10, HTA 9, VVK 6, HIA 5, W4WBC 5, AAD 4, CXQ 4, DVT 3, K4RZJ 2. (Apr.) K4ELG 294, JKK 193, W4BZE 42, OOL 42, K4TFL 7.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Festus R. Greathouse, 8PZT. SEC: HZA. PAM: GAD. V.H.F. PAM: K8IYU. RMs: GBF, FNI, PBO and VYL. K8JLF is a new ORS. K8GGG is a new OES. He received honorable mention in the recent high school science fair for his radar project. VK3MX, who operates 20-meter a.m. phone, is interested in working West Virginia hams for the W. Va. Award. He QSOs WHG and BIT often. West Virginia hams did a lot of fine v.h.f. DX work in the recent openings on 6 meters. K8KFA and K8JLW are two new hams on 6 meters. The Central Ohio Valley 6-Meter Net, with K8OAK as NCS, has 25 members scattered from Wheeling to Huntington. IBF is building a Re-entrant cavity filter for 6-meter TVI. The W. Va. C.W. Net is operating Mon., Wed. and Fri. during June, July and August. K8KFK received a 32V-3 as a high school graduation present. K8CSG visited 3WXB recently. IITLR, in Charleston for two months, visited the Kanawha Valley Radio Club. K8AXU has a ten-element, 220-Mc. beam in operation. Traffic: (May) K8KLF 220, W8FNI 210, K8KFK 83, W8NYH 42, HZA 40, BWK 33, K8CNB 26, GAG 7, CSG 6, BRM 4, DDB 4, W8SNP 4, TVO 3, K8BLR 2, W8IBF 2. (Apr.) K8BRM 122, W8FNI 113.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W8BWJ—SEC: NIT. PAMs: CXW and IJR. RMs: WME and K8EDK. Our RM has been one of the busiest men in Colorado. Much effort is being put into the organization of a sectional c.w. net to begin operation in the early fall. Anyone interested in traffic net operation, either old-timer or newcomer, should contact K8EDK. FVD is the net recorder and a monthly paper is published to provide news and comments for the net. The Denver 6-meter group provided communications for the Porsche Club (Continued on page 128)

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FUNDAMENTALS OF RADIO TELEMETRY by Marvin Tepper. Telemetry makes possible the collection of data on which the improvement of existing rockets, missiles and aircraft is based. This exciting book explains its purpose and explores its techniques. Special sections are devoted to missile and satellite telemetry and hardware, and to data recording and processing. Specially prepared illustrations. #225, \$2.95.

PHOTOTUBES (volume 33 in the *Electronic Technology Series*) edited by Alexander Schure, Ph.D. This penetrating study into the field of photo tubes deals with the subject both from the physics of photoelectricity and from the electronics of practical tubes and circuits. Special attention is given to such diverse topics as the laws of photoelectricity, radiation spectrum, intensity-wave-length curves, concepts of quantum theory, structure of phototubes, ratings and applications. At all times theoretical information is balanced by practical information providing the reader with a comprehensive understanding of the field of photoelectricity, phototube devices and applications used in this field. #166-33, \$1.80.

BUILDING THE AMATEUR RADIO STATION by Julius Berens, W2PIK. If you intend to buy the equipment for an amateur radio station, or build one, you will find this volume indispensable. This book is the next step for the beginner amateur radio enthusiast who has earned his operating license. A guide for the construction of the beginner's transmitter and receiver. Also includes instructions for receiver and transmitter on-the-air operation. #221, \$2.95.

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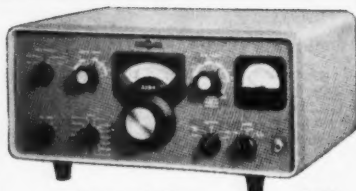


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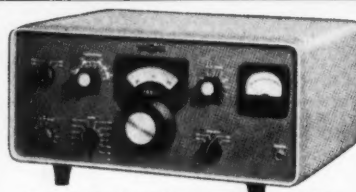
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Hill Climbs through BTO, TIL, CLJ and MIV. This group also is active in c.d. drills. AGU has moved to Pueblo as pastor of Bethel Methodist Church. The *PAPA Newsletter* reports the best impression at its picnic was K0DND and his XYL with harmonies 1 through 10 wearing T-shirts numbered according to age and wearing K0DND on their backs. PLG has moved to Los Angeles, and the new QTH of GGY and TYB is Carlsbad, N. Mex. All who knew him were saddened to hear of the passing of SGG. Appointments as OBS, OPS, ORS and OBS are available. Most needed are Official Bulletin Stations. All interested operators on 40 or 75 meters are urged to apply. Attention all clubs: Please send copy of your bulletin to the SCM for news items. Please get your reports in on the first of each month. Traffic: W8KQD 335, K0EDH 163, W8WME 136, K0EVG 131, W8DQN 103, ANA 89, QOT 40, K0LCZ 12.

UTAH—SCM. Thomas H. Miller, W7QWH—Asst. SCM; John H. Sampson, 70CX, SEC; FSC, PAM; BBN, V.H.F. PAM; SP, RM; JBV, K7-DKA, DJW and ERO have been awarded net certificates on the Beehive Net, bringing to 23 the number that have been issued. The net has only 26 members on the roll. VEO has a new trap vertical antenna and a new SX-100 receiver. CKD and QWH have new jr. operators in their shacks. FSC took a trip to Glen Canyon Dam and stopped to see GOW at Bryce Canyon and BNZ in Richfield and met ZSX, another Salt Lake ham in Kanab. ZKL is in Sun Valley, Idaho, for a summer job. K7CLS is using plate modulation on his DX-40 and is now working on a differential keying for it. K7AUM graduated as valedictorian from Juab High School. JBV received a PAN certificate for outstanding service as a representative to an area net from a regional net. Traffic: W7JBV 326, OCX 112, VEO 12, QWH 9, K7AUM 8, CLS 6.

NEW MEXICO—SCM. Allan S. Hargett, K5DAA—SEC; CIN, PAM; ZU, V.H.F. PAM; EPB, RM; TUE. The NMCPN meets Sun. at 0700 MST and Tue. and Thurs. at 1900 MST on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0630 MST on 3838 kc. The New Mexico Brass Pounders Net meets Mon., Wed. and Fri. at 2000 MST on 7180 kc. The TWN meets Mon. through Sat. at 1900 MST on 7160 kc. Please support your nets. Our new RM is ZHN. POI is the new c.d. director in Farmington, replacing CIN. K5IPA, Portales, is very active in getting RACES going in his community. New calls in Portales are KN5UVS, KN5UYV and KN5TYZ. Radio Officer ZU will go to Portales in the near future to help get the RACES off to a flying start. CA, of Albuquerque, is in the hospital very ill. SBJ left for an airplane trip. New calls in Carlsbad are 0TYB, 0GQY and K5VGL. The Annual Hamfest in Carlsbad will be held Aug. 23. Make your plans now to attend. Traffic: (May) K5WSP 2386, W0ME/5 310, W5DWB 235, ZHN 166, K5LMI 107, DAA 26, IPK 23, QYA 14, W5D 8, HJF 6, K5DAB 5, LWN 4, PAT 4, RIT 3, W5WPA 3, K5IQL 2 (Avr.) W5DWB 383, W0ME/5 300, K5LFE 106, PRR 14.

WYOMING—SCM. Lial D. Branson, W7AMU—SEC; CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The YO Net has adjourned for the summer months and will reconvene Labor Day Eve. KN7GYT, at Cody, passed the General Class exam. The Casper Club was active on Field Day. SCM AMU and SEC CQL visited the Sheridan Radio Club and had a very nice meeting. There were 32 members present and we found the club has 100 per cent ARRL membership and has the 100 per cent certificate on the wall. The Big Horn Basin hams are planning to become ARRL affiliated. The club is formed by hams in Basin, Worland, Gebo, Thermopolis and Riverton. Others desiring to, may join. Traffic: W7BHH 24, AMU 1.

SOUTHWESTERN DIVISION

ALABAMA—SCM. Clarke A. Simms, jr., W4HKK—SEC; WJX, PAMs; DGH and K4BTO, RM; RLG. It is my pleasure to announce the appointment of two new ECs. WHW will be EC for Mobile County and AZX returns as EC for Montgomery. Welcome back to 5A1Y, now 4GYW, and also GYT, whose old call is unknown. K4JSP is very proud of a new receiver and TGD is using a new Triband vertical for DX work. ZXX has earned his AENB Net certificate. I am very sorry to announce the death of EYL. The Florence ARRL-c.d. group is better prepared now with 3 small and 3 large generators. The Opelika Club is making good progress with the work on its new club house and will join with the Auburn and Valley Clubs in sponsoring the Chewacla Ham Picnic the first Sunday in October. Remember the date. The Montgomery Club is holding test alerts for its mobiles. Has your group been trained completely for

(Continued on page 130)

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RATINGS

Type	FILAMENT		Max. Plate Dissipation (Watts)	USEFUL OUTPUT* CLASS AB ₁ LINEAR AMPLIFIER Plate voltage in volts				
	Voltage (Volts)	Current (Amps)		1000	1500	2000	2500	3000
PL-6549	6.0	3.3	75	96W	140W	210W	—	—
PL-177A	6.0	3.3	75	96W	140W	210W	—	—
PL-175	5.0	14.5	400	—	—	470W	605W	710W
PL-172	6.0	7.8	1000	—	—	1020W	1280W	1540W

*Actual power output delivered to load from typical amplifier.

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EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT, RM: K4SHJ. PAMs: TAS and RMU. New officers of the Manatee ARC are IYFD/4, pres.; FGK, vice-pres.; ENJ act. mgr.; K4BY, secy.-treas. The Indian River ARC held its Annual Beach Party May 10 with a good turnout. A new ham at Cocoa is KN4FTN. K4OYR and SXO both have Viking KWs on the air now. K4DRO received his AI Operator certificate. Tom also won the Florida Ship Alphabetical WAS Award. K4SLR has a new SX-101 and Triblender. The Florida YL Novice Net is progressing very nicely and meets on 7185 kc. You Novice YLs who are interested should contact KN4ANR, P.O. Box 358, Howey-in-the-Hills. The Lake ARA furnished communications for the Watermelon Festival Parade at Leesburg May 22. This is a fine way to receive good publicity for the hams of our State. The newly-formed Hollywood ARC has selected 6 meters as the band best suited for its emergency net. The club offers code practice sessions on 6 meters Mon. and Wed. nights at 1930 EST. WPD has a new HQ-170. The Orlando gang furnished part of the much-needed communications for the Outboard Marathon Race from Sanford to Jacksonville and return. This is another good public service that the hams can be proud of. Fellows, don't forget to send in any news of this type, along with pictures if possible. We are now in the middle of the hurricane season and some of you may be called on to provide emergency communication before the season ends. Keep on the alert and check your gear. Traffic: (May) K4QLG 485, SJH 361, LCD 320, LCF 210, ILB 206, W4LMT 123, K4KDN 123, BV 74, ODS 66, BLM 59, W4YTT 59, K4RNS 40, U4I 40, W4KGJ 20, K4VRU 19, W4DUG 18, K7CMZ/4 18, K4MBB 17, MTH 17, SLR 11, W4DQS 9, FFF 9, K4OSQ 9, MTP 7, BZ 5, JZZ 5, AHW 4. (Apr.) K4KDN 98.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW, RMs: AXP and BVE. Perry: KN4s FTG, FXD and GID are new hams. KQP reports the H.S. Radio Club had a Field Day and used emergency power. Tallahassee: The Leon HS Club's new officers are K4PVU, pres.; K4MZT, vice-pres.; and Dan Pyle, secy.-treas. KN4HEZ is a new ham. TCU is the new Leon County EC. Port St. Joe: A club has been formed, with K4RZF pres.; MXN, vice-pres.; and WEB, secy.-treas. A TVI committee also has been formed, with WNF and CCA. Panama City: K4OID is back on after locating a new receiver. Fort Walton: The Eglin ARS held an FB picnic and shrimp boil on the beach at SMM's QTH. A mobile club, nicknamed the "Whipsnappers," has been formed, with ZLY, WOQ and K4UBR as officers. Pensacola: K4HYD has a new SX-101. PAA HYL and 50DC are active on 15 meters. SPB has been transferred and will be missed by his many friends. OOW has modified the club Challenger rig for PTT. A tri-band beam has been installed at the NAS Club by K4HYL and K4UKG. The club has a new SX-101. The PARC and the NAS Club had a joint Field Day. Grice Radio is running code and theory classes for beginners. Many W. Fla. hams were seen at the Mobile Hamfest. HIZ won the hidden transmitter hunt. RKH was the hidden bunny. Traffic: (May) W4BVE 75, K4PVU 42, UBR 14, W4GAA 4. (Apr.) K4PVU 24.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST on Tue. and Thurs., 6800 on Sun.; GSN Mon. through Sun. at 1900 EST on 3995 kc., DDY as NC; the 75-Meter Mobile Phone Net each Sun. at 1930 EST on 3995 kc., MV as NC; Atl. Ten Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC; GTAN Sat. at 1000 EST on 7290 kc.; GPVL Net Thurs. on 7260 kc. at 0900 EST. K4CYV as NC; GAN on 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. The Atlanta Radio Club had a wonderful hamfest at the Officers Club June 6. Many Georgia Peaches were present and took away many prizes. ZD, our Southeastern Division Director, gave us a rundown on what took place at the Board Meeting in May. Georgia's SEC, who has been ill for some time, was present and we were happy to see him. New officers of the Columbus Radio Club are K4SZL, pres.; VUO, vice-pres.; WXW, secy.; K4VGI, trans.; K4JNL, act. mgr. K4VCM has been busy with final exams at school. On May 17 the Augusta Radio Club had a wonderful hamfest. President K4AUM and his officers went all out to show everyone a fine time. ARH/6 wants his buddies in Georgia to listen for him on 40 and 20 meters. K4LEM is inactive. AQL, the Georgia Tech. station, has a new 812 rig built by YV5ABZ. K4TYZ and K4LEM, LRG is building up a pair of 4X-150As for 220 Mc. CFJ is looking for some late UX or TV-199 tubes. Also a circuit of a Radiola Model 20, KN4EII and KN4FOW

(Continued on page 132)

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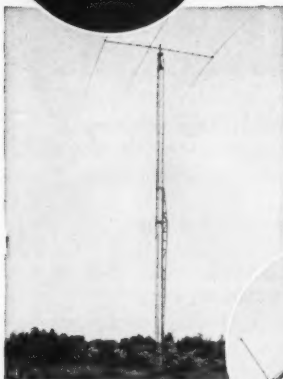
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are new hams in Cleveland, Ga. The Dalton, Ga. Club's new officers are K4STI, pres.; K4ZFO, vice pres.; K4VLE, secy.-treas.; K4FLC, net mgr.; K4DCW, advisor. Those on committees are CGT, ZTJ and HIO. CFJ and K4CZR are proud grandparents. K4LVE is taking a course in ECI. K4VHC will be portable from Rockhill, S. C. Traffic: (May) W4DDY 390, K4BAI 101, LVE 72, VHC 62, HJZ 56, BVD 50, PHA 21, VCM 6, W4FWH 3, (Mar.) W4DDY 449.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. The Antilles Weather Net started twice-daily net sessions June 1 at 7 A. M. and 5:30 P. M. on 7245 kc. with KV4BA as NCS. Twenty VP2s, VP9s, FG7s, FM7s, plus several KP4 stations, reported at the first session. The P.R. Amateur Emergency Net on 3925 kc. at 7 P. M. Wed., will shift to 7245 kc. after roll call to pick up additional 40-meter-only stations at approximately 7:30 P. M. 7245 kc. is now the day frequency of the P.R. Amateur Emergency Net. WP4PI is now KP4 and was rewarded with an HT-32 and Triband beam. AAA is off until he finishes the new air-conditioned concrete radio shack. WPAOD received his General Class license and will operate a Globe King 500-A at Colegio San Jose. KV4BA has a new plate transformer in the Globe King, a new DowKey t.r. switch and is awaiting a DSB-100, AOF/AOD received a Mohawk receiver kit. The U.P.R. Radio Club station FAE has a new Valiant transmitter on all bands. AKH is practicing with a new bug key, as is ACQ, who just bought a new Vibroplex. AOH and AKB are new net stations on 3925/7245 kc. from Ponce. HK1TX reported to the P.R. Net on 7245 kc. ES's son is awaiting his Novice call. JM has a new Tapetone Skysweeper receiver for 6 meters, a 2-meter converter and a Gonset 2-meter antenna. CB sends greetings from Rio de Janeiro via JM. Ponce hams are resurrecting their radio club. ANQ and LC are two new mobiles heard on 40 meters. LC is using a Bendix 200-watt transmitter in the trunk. RD added an HT-32 to his KWS-1 and Viking II. PZ is driving a GG 4-250 to a kw. on s.s.b. using a Viking I driver. SZ is moving to San Juan. Traffic: KP4WT 79.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—RV and his family will be vacationing in the United States from June 7 to Aug. 28. During this time WA will act as SCM. The Crossroads Amateur Radio Club's new home is progressing very nicely and with the addition of the new civil defense equipment will be heard on the airways with the call PA. The members were on all bands during the Field Day activity. Traffic: KZ5AD 50, OB 43, RR 30, VF 30, VR 27, CD 3, DH 3, EL 3, LV 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, Jr., W6JQB—SEC: W6LIP, RM's: W6BHG and K6HLR, PAM: W6ORS. The following stations earned BPL this month: W6ZJB, K6MCA, W6WPF, K6LVR, K6HLR, W6GYH and W6BHG. Congrats, fellows! It is good to welcome W6WPF back to the traffic gang. K6LVR now is handling liaison with the Pacific Net on 20 meters. W6EBK is going fishing in Oregon and Washington! Congrats to K6OQD on receiving a Public Service Award! W6KAR has a Mosley beam on Mt. Top at 5000 feet! K6TJG will be operating mobile from the Kansas City Area. K6TPL still is knocking off Pacific DX on 20 meters. WA6ARR is sporting a new Challenger. W6AM reports fine attendance visitors' day at the shack. K6OJV now is handling TCC skeds. K6VIZ is working the Pacific Islands. W6SRE is travelling around the State and visiting hams. The Intra-County Net on 420 Mc. will be off the air for the summer and expects to start in the fall. K6GLS got FYTYF for a new country. W6ORZ reports much QRM from school exams! K6EA is back hanging the traffic nets again! W6UFJ made CP-20 and RCC awards. K6COP reports that KR6MD will give a special award for any 6-meter contact. W6OYM has a 5-watter going on 420 Mc. and is experimenting with antennas. The Santa Fe Railway Employees Radio Club officers are K6COK, pres.; K6SJA, vice-pres.; WA6BGI, secy.-treas. Support your section nets: Phone, SoCal 6 Net on 304 Mc. at 1700 PDT daily; c.w., Southern California Net on 3600 kc. at 1930 PDT daily. Traffic: (May) W6ZJB 2265, K6MCA 2242, W6WPF 1186, K6LVR 1141, K6HLR 1082, W6GYH 676, K6OZJ 417, K6OJV 292, K6PLW 230, W6BHG 215, W6KAR 173, K6JSD 137, K6PZM 122, WA6AKS 98, K6GCC 96, K6TPL 86, K6OQD 52, K6GLS 51, W6USY 24, W6EBK 22, K2HNW/6 18, W6CK 16, K6VIZ 16, W6CMN 10, W6ORZ/6 10, K6EA 9, K6TJG 7, W6SRE 3, W6AM 2, (Apr.) K6MCA 1766, W6ZJB 1483, WA6AKS 138, W6KAR 113, WA6CTK 8, W6SRE 6.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF, PAM CSN, 3880 kc.; FMZ, YAT has moved to N. Ogden, Utah, and hopes to be on the air soon. About 40 were present at the Northern Arizona Hamfest held at Whitehorse Lake. DZG has gone sideband.

(Continued on page 134)

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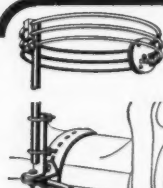
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K7DHL is working the 12th Regional Net and HBQ the Mission Trail Net and bringing traffic to the Copper State Net. How about some reports on what you are doing so that I will have something to write about? All it takes is a post card the first of each month. UDI has moved into his new home. Traffic: W7YAT 126, OIF 6.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Our Division Director, W6MLZ, spoke at the Newport Amateur Radio Society in June. W6KVB has a new Trihand beam up and is operating with a new SX-101A. K6STH is a new General Class licensee in the South Bay Area. K6BTO can now operate on all amateur bands from 160 meters to 430 Mc. K6BX now has an HT-32A and an HT-33A on all bands. W6YDK has a traffic count of 2563 to lead the section. K6ZCR, in Fullerton, has made BPL for the first time. Her traffic count in May was 251, of which 44 were originated and 73 delivered. She also is an OO as well as an ORS. The June meeting of the San Diego DX Club was held at the home of W6LRU. W6BUX went to Alaska with a local YMCA group from San Diego. The Helix Club enjoyed a ladies' night dinner in June and then a tour of local radio and TV station KFSD. K6BPI was disrupted for a time when he sat down to operate one evening and his chair went through the floor. Termites! Tony now has a new floor in the shack and is active again. We are sorry to report that W6JUT, long-time s.s.b. enthusiast in San Diego, recently was hospitalized for surgery. With summer now in full swing, please remember to supply your SCM with news for this column. Traffic: W6YDK 2563, W6EOT 588, K6ZCR 251, W6KVB 4.

SANTA BARBARA—SCM, Robert A. Henke, K6CVR —The Oxnard and Paso Robles Clubs held special meetings for the purpose of presenting a lecture by M. T. Southworth, W1LW, on the ARRL IGY project. He showed slides and gave an informative talk along with them. W6FYW's ORS appointment has been endorsed for another year. K6VDW is an OES and is experimenting with meteor scatter and reflection. There should be some rather interesting results from his experiments. W6OQX, K6GHU and K6KCI did a very good job of handling about 150 pieces of traffic for the Ranchoero Visitadores. The chairman was very pleased at the way that other hams cooperated in passing their traffic. K6KCI, chairman of the YL Convention in Santa Barbara, reports that a total of 80 YLs were present and enjoyed themselves very much. Traffic: W6FYW 4.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX, PAMS: BOO and IWQ RM: ACK. A reminder to net managers: Now is the time to get all the information together to register your nets. Aug. 1 is the beginning date for net registrations so get the information together and send it in. Speaking of nets, I think the net managers and net control should pay a bit more attention to their frequency. Try to get everyone to zero on net control frequency whether it be the exact net frequency or not. By doing this all stations will be on one frequency and not scattered over 5 or 10 kc. As you all know, our main talking point for a net is that 40 or more stations will be operating on one frequency instead of being scattered all over a particular band. K5IBB is now on s.s.b. His NYL won the 10B offered as pre-registration prize at the Abilene Swapfest May 3. K5KBH made WAZ, and also reports working ZL2AHZ on 40-meter phone. The Brownwood RACES got a good workout in the recent cloudburst and flood threat. Two new hams in Commerce, KN5TOW and KN5TOZ, are both running a DX-20. PWS has a new Hy-Gain Trihandler. K5BWL and BWM have moved to Shreveport. K5IDZ got a new YL harmonie May 15. K5MGA will go to Colorado for summer school work in geology. Please remember the deadline for news and traffic reports is the 5th of the month. Please help me by getting your reports in on time. Traffic: W5ACK 341, UTW 294, BKH 242, K5IDZ 165, JSN 77, PXV 62, HGL 57, ACD 32, W5OCV 18, MUB 13, K5KBH 12, JZK 11, W5KYM 10, K5IBB 9, EGB 6, W5GY 6, RV1 3.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC —SEC: K5KFS, RMs: JXM and VVQ. PAMS: DRZ and MFX. V.H.F. PAM: VCJ. Sooner-Nooner Net reports for May, 645 stations, 257 messages and 26 sessions. This shows a very active net. Preacher DRZ and his NC's are to be congratulated on the FB job. A new ham in Blackwell is K5VHB. EHC was on temporary duty at the Dallas Collins plant, IYU and K5JLL have new Hornet beams. OOR is a new Collins engineer assigned to the Aeronautical Center. JSP has a new Apache rig. K5GDM is now on s.s.b. K5HQP is working 6 meters with a Seneca. 9HSF and K6QNF are in Bartlesville. JWA and ODK are being transferred. OO RRM made

(Continued on page 136)

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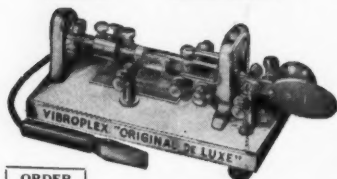
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DXCC, UFC was elected to Tau Beta Pi, honorary engineering scholastic society at the U. of Colo. The Bartlesville and Muskogee Clubs competed during Field Day. KN5VCA is on the air with a DX-40. Our hat is off to K5MBK for making BPL and helping K5USA to make BPL also. Oklahoma Ham of the Month: KY for his FB contributions to the League and to ham radio in general. Traffic: (May) K5USA 549, MBK 790, CAV 270, JGZ 123, W5DRZ 114, VYQ 82, FEC 62, K5OCZ 33, INC 32, JTW 29, W5MFX 26, MGK 21, K5SWJ 16, W5JXM 14, PNG 14, K5ELG 13, W5WAF 11, K5CBA 9, LUR 9, BNQ 7, W5CJV 5, VLV 4, K5JOA 3. (Apr.) W5VLW 12, JXM 4.

CANADIAN DIVISION

ONTARIO—SCM, Richard W. Roberts, VE3NG—TX was involved in a rather serious accident with his boat in May. A gas explosion resulted in very serious burns all over his body. We are happy to report that Jack is recovering very rapidly and will be on deck for the North Bay Hamfest. CFR is now mobile. AYS is on 6 meters. COO is FB on ECN. Ottawa elected the following to serve for the coming year: BEB, pres.; CIZ, vice-pres.; GI, secy.; CDS, treas.; CDI, tech. advisor. CDX is hot shot lincoln twist the Ontario Phone Net and the National Traffic System. OE is mobile. DAU is a Silent Key. Jimmy will be missed in Gannaque. Your SCM has been very ill but managed to visit the Scarboro Club. A fine meeting was held and I enjoyed seeing old friends. I regret missing the Ottawa Banquet but duty called. FY is going to VE6-Land. The OARA is making good strides in organizing. The Windsor ARC will swap club papers with any other club. The Ottawa Valley Mobile Radio Club puts out a hot club paper. The QTH is 280 Flora St., Ottawa. The Nortown ARC elected Mr. Buckley, pres.; George Wolf, vice-pres.; L. Stanway, rec. secy.; D. Roblin, corr. secy.; L. Morehouse, treas. The London Club is firing up the big guns for the ARRL Convention to be held in the fall. The Peterboro Club did an excellent job of assisting at the Bewley Boat Races. NG is maritime-mobile on Georgian Bay. BMX has a 73A-4. CNB visited DPG and DJV. EII visited DTB and CNT. ELC is away to G-Land with his Heath gear. Traffic: (May) VE3DCX 99, BUR 95, NO 82, EII 70, EAU 63, AUU 59, NG 56, DPO 48, CLF 44, CFR 41, BZB 30, DH 23, KM 22, OE 21, EAM 14, ELC 14, DWN 11, DLC 5, CE 4, VD 2. (Apr.) VE3AUU 63.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—All Canadian amateurs feel honored that our own Director, Alex Reid, VE2BE, has been asked to attend the forthcoming Conference at Geneva as a member of the Canadian delegation. It is with much regret that we learn that ATL, because of the pressure of work, has resigned as president of the thriving young French Club, JC. He has been our chief source of information for this column and we take this opportunity to thank him heartily for splendid cooperation. We hope that ABE will be able to take care of the chore of "chief snooper." AJO, with fine antennas, continues to pile up the countries worked. We believe he is now up to 210. APC has almost finished his private pilot's course. KB skeds FP8AP regularly on 20-meter phone. AWK surprised everyone by reappearing with a DX-100 and an HRO-5. DD also is back on 20-meter phone. QG enjoys mobiling with his new Cheyenne transmitter. AWR took part in Armed Forces Day. We are saddened to learn that II has pulled up stakes for a new California QTH. AUH, TI and AJD were reelected on the executive board of the St. Maurice Amateur Assn., MO. WT is very active on traffic nets and is trying for a 35-w.p.m. certificate. Big news: WW is preparing for the "drying-up" of high frequencies by designing a new beam: two elements on 80, three on 40, five on 20 and nine on 10 meters. AHW copped the VE2 award in the VK/ZL Phone Contest. AQQ used to sign VETTX. AGM likes c.w. and swings a mean fist. DB is another excellent c.w. man. The s.s.h. boys report good DX when conditions generally are poor. Traffic: VE2DR 104, EC 30, WT 22.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: PV, VM recently became the proud possessor of a brand-new female harmonic. PV has been designated as PAM for the Alberta Phone Net, replacing OD who did such a fine job for twelve years. 35 per cent of the participants from the ham class conducted by AC and VM were successful in obtaining licenses. HB, NS, OC, CA, DJ and SS recently participated in a 3-day c.d. exercise in Canrore. The new QTH for YM, EP, OM and ON will be Edmonton. A new licensee, AAJ, is sporting a three-element trap Mosley Triband. Welcome to the fraternity. Boh, NT is now a 2-meter mobile. Traffic: VE6HM 82, YE 64, PV 4, SE 4, BA 3, SS 3, FS 2.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—SEC: KX. Congrats to HR, who was awarded the BCARA Trophy for his unselfish job of handling the QSL Bureau in B.C. for many years. Also congrats

(Continued on page 138)

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- A complete SSB transmitter or exciter for higher powered linear amplifier!
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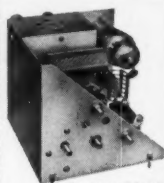
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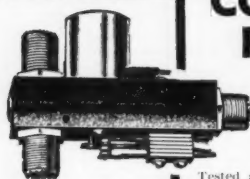
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to KX on being the first VE7 ever to win the BERU C.W. Contest. The BCEN is loping along with the stalwarts and new members adding to the strength. TF is tinkering with RTTY and plus a new NC-303 he is away to the races. AOT and AAK have new QTHs and with bated breath and crossed fingers they say the QRN is at a low level. APN and APW are going great guns on the BCEN. NJ, the old brass pounder, is back in full swing after a visit East. News from the hinterlands: AQD is the first graduate of the Chilibush Club classes and is on the air on 80-meter c.w. Hope you all had a good time and made a good score on Field Day. The Victoria Short Wave Club has taken the matter of license plates under its wing. We wish the club luck on it. Traffic: VE7AAK 77, APN 44, AOT 27, KX 10.

MANITOBA—SCM, James A. Elliott, VE4HF—JW has built a five-element beam and is using a Gonset Communicator. ML's beam blew down. 5XX was a visitor to Winnipeg on a business trip from Weyburn. 4VJ is working s.s.b. on 20 meters. AN has gone to the old country for a three month's vacation. WS arrived home in April from a three month's vacation in VK- and ZL-Lands. IF has been having his troubles lately. His PMR 7 was stolen from his car in May; also his 80-ft. tower blew down in a wild wind and rain storm. Not long ago his daughter, PE, had her mobile receiver stolen from her car. CX is going to work 20-meter s.s.b. mobile on his trip to California. JP has been very active on 75 meters and will be working s.s.b. on the higher frequencies soon. MN, TE and KP attended the hamfest at Moose Jaw, Sask. XP has just completed a major job of rebuilding and is back on 75 meters. JQ and 8Q. John and Fran, are busy rebuilding their home. KP has worked all Canadian districts except VE8 via mobile. SA has been active on 20 and 75 meters. He went into the hospital for a long-delayed operation but will be looking for his friends on the bands during his six weeks period of convalescence. Traffic: VE4GE 18, JW 10, SL 7, EF 6, QD 4, XP 3, AN 2, EG 2, RB 2.

SASKATCHEWAN—SCM, Lionel O'Byrne, VESLU—ES has installed a mobile rig in the new car. JR has been appointed EC for Weyburn. XX has a new Ranger and reports it's FB. The two-day Provincial Hamfest was held in Moose Jaw with the Moose Jaw Club as hosts. About 200 hams and their families attended. Lively discussions took place at the ARRL meeting, notably regarding license plates. Mr. J. O. Probe, Civil Defense Director for Sask., gave an excellent talk on the role of the amateur in c.d. work. IG, our SEC, reports good cooperation in the recent c.d. exercises. FG is recovering from a spell in the hospital.

Parametric Amplifiers

(Continued from page 16)

best average reception over 144 to 144.2 Mc. The signal generator was connected into one jack at 144.1 Mc. with outputs up to 100,000 microvolts available. The usual 2-meter receiver was disconnected and an APR-1 receiver tuning 300 to 1000 Mc. was substituted. By using another signal generator in the 450-Mc. range, the input to the APR-1 receiver could be found by the substitution method. At the pump frequency of 482 Mc. the output across 50 ohms measured 80,000 microvolts or 80 millivolts. A high-Q 144-Mc. circuit between the antenna and the parametric amplifier is indicated for reducing radiation from this source.

The unwanted output at the two idler frequencies, 626 and 338 Mc., was in direct proportion to the signal input at 144 Mc. It measured 5000 microvolts for a 10,000-microvolt input, 500 for 1000, and 50 for 100, at the lower idler frequency of 338 Mc. At the upper frequency of 626 Mc. the outputs were 2000, 200 and 20 microvolts, respectively. Since the parametric amplifier would probably only be used on signals of 1 microvolt or less, the outputs at 338 and 626 would be less than 1 microvolt—not enough

(Continued on page 140)

You're "On the Move"... with the **Hy-gain** Trap Traveller

**MOBILE
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- ★ Automatic 10, 15 and 20 meter operation with **ENTIRE WHIP OPERATIVE** on all three bands for **MAXIMUM EFFICIENCY**.
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- ★ Designed for 52 ohm Coax, SWR less than 2:1 on all bands.

for 10, 15 & 20
Meters

8' 4½"
Extended
for
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**Telescopes
Down to
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for
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AUTOMATIC LOADING COIL NO. T-3

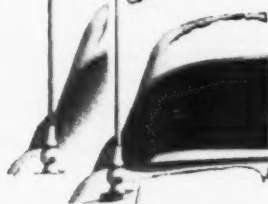
Trap traveller mobile automatic three band loading coil Model No. T-3. May be used with any standard three foot base and 5' whip or with Hy-Gain telescoping base section and top whip assembly. Air foil design only 1½" wide by 4½" high.

\$14⁹⁵

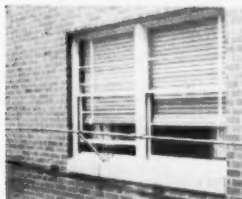
Trap Traveller Telescoping Base Section

Hy-Gain telescoping base section and top whip assembly, Model TBW; fits all standard mobile mounts. 5' top whip, when used with Trap Traveller coil telescopes from 8' 4½" down to 3'. Positive grip, knurled knob connections.

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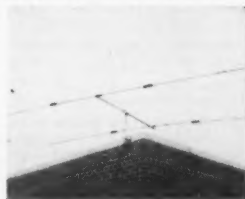
Portable MICRO-DIPOLE KIT



Trap Traveller Dipole Kit requires two 3-band loading coils and makes into mid get high efficiency dipole for 10, 15 & 20M. Mounts anywhere; matches 52 ohm coax; low SWR, all three bands. 16 ft. overall when extended. Sections collapse to 3 ft. for easy carrying. Complete with all hardware (less the two loading coils). Wt.: Only 3½ lbs. Model TDK: **\$9.95**. Complete Dipole with loading coils: **\$39.85**.

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Trap Traveller Beam Kit requires four 3-band loading coils and makes into world's first miniature 2-element, 3-band portable beam. 16 ft. overall when extended, boom 6 ft. long. Collapses into 3 ft. package for easy transportation. All elements, boom, aluminum. All hardware included (less the four loading coils). Wt.: Only 9 lbs. TUK: **\$19.95**. Complete Beam with loading coils: **\$79.95**.



UNIVERSAL MOUNTING BRACKET

Uniquely adjustable screw driven clamp mechanism with 2" mast for mounting the Trap Traveller Dipole or Beam almost anywhere. Adjustable through a 90 degree arc from vertical to horizontal. Wt.: Only 2½ lbs. Model UB: **\$9.75**.

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Attractive and convenient plastic carrying bag with full-length zipper holds either Dipole or Beam when collapsed. Plenty of space for Trap Traveller coils and Mounting Bracket in addition. Model TCC: **\$9.95**.



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Strong, lightweight aluminum construction features exclusive design... outer tower sections crank-up first permitting safe, guy-as-you-go procedure.

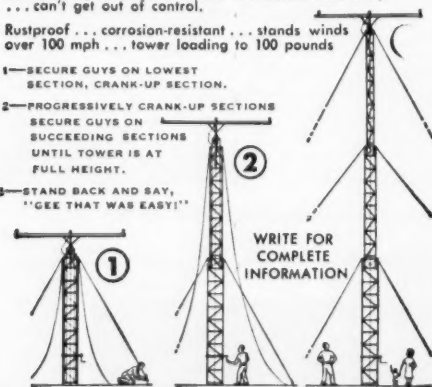
Raise or lower the tower as needed... protect against sudden adverse weather... also adjust antenna without climbing tower. Each section has automatic lock-up... can't get out of control.

Rustproof... corrosion-resistant... stands winds over 100 mph... tower loading to 100 pounds

1 - SECURE GUYS ON LOWEST SECTION, CRANK-UP SECTION.

2 - PROGRESSIVELY CRANK-UP SECTIONS
SECURE GUYS ON SUCCEEDING SECTIONS UNTIL TOWER IS AT FULL HEIGHT.

3 - STAND BACK AND SAY, "GEE THAT WAS EASY!"



M-4620 Tower, 56' with winch and feet... 249.00 fob factory.

ROTATOR PLATE - TOP PLATE.
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radiation to worry about. However, the pump oscillator output would still be up near 80 millivolts, or about 125 microwatts into a 50-ohm dipole. A carefully designed high-Q coaxial tank circuit tuned to 144 Mc. would reduce this oscillator radiation by a factor of about 100 without sacrificing more than 1 db. in gain and noise figure. A small neon bulb across the top of this extra tank circuit would probably fire when a high-powered transmitter in the station is keyed, thus protecting the varactor diode against overload when the antenna relay isn't self-shielded for the receiver input side. **QST**

How's DX?

(Continued from page 80)

Vice-President W5NW, now past the 250-mark, finds new ones so hard to find that he's getting sociable once more on 40 and 80. In lines to W7DJU, KL7DR decries this summer's propagation conditions in Alaska. He's hoping for the usual August pick-up but the issue is in some doubt. Weather there is often rough on the beamey, too. "VP2KJ operates single-sideband with a KWM-1 on 15 meters," establishes W8MXS, "generally evenings between 21,400 and 21,445 kc." VP6WD, formerly G2WD, enjoys his Barbados retirement with 50 sideband watts, a Mohawk receiver, rotaries and a ground plane. LMREAC of the city of Puebla, Mexico, offers a "Fifth of May" DX certification to DXers throughout the world. Yanks can earn same by submitting proof of contacts with two Puebla XEs on two bands, QSOs to date after the 1st of this year. For the finer points check with XE1JP at the club address, 2 Poniente 511, Puebla, Pue., Mexico. Mayday! K2UYC requires a direct address for UA8OM; W3AXT yearns for the current whereabouts of H8EW, K84AA and SU1GH; and W1RNP will settle for a tracer on operator Wes of SV0WN (1958). No, Calif. DX Club's organ points out that next year will mark W6TI's silver anniversary as ARRL QSL manager for our sixth call area. VERON has VE5 2IC and 3ABE anticipating a 14-Mc. St. Pierre stand later this month. W5AH1 relieves W5 GNC; KBU and NW at the editorial helm of the West Gulf DX Club's *DX Bulletin*, one of the snappiest periodicals in its field. XE1s AAT BI and CV, prime movers in XE4B matters, hope to provide more Revilla Gigedo's c.w., a.m., s.s.b. and radioteletype QSOs from Socorro in time to come. Check with W8JIN for details on OVARA's new Ohio Valley Award, a neat certification available to those who submit proof of necessary QSOs with OVARA members. Thirty-five points will qualify you at three points per 80- or 160-meter QSO, two points for 40, and one point on 14, 21 and 28 Mc. "How's" lost a long-time contributor and handom a wonderful exemplar of the art when W6ZZ, ex-W1WV, joined Silent Keys in early May. After some 40,000 QSOs since 1927, the QSLs of Miles Weeks will grace many a hamshack wall for years to come.

Ten Years Ago in "How's DX?" - Our August 1949 prologue argues for wider utilization of our lower frequencies for serious DX work. Eighty-meter activity reaches its midsummer low point but HR2HZ and YS1ZG bring W4BRB to the 61-country mark on 3.5 Mc. On 40 we find FK8AB, GD3UB, KJ6AF, KV4AA and W6COI/-KB6 rewarding diligent static-stabbers. Twenty c.w. is good for AC4s RF YN, EK1s DO GW, FE8AB, HE1EC, KC6s EA WA, MD2G, PK4DA, Macquarie's VK1AJT, wandering W6s HW1/KS6 and MCF/C3, YK1UN and ZD9AA. Mike manipulators manage 14-Mc. A3 delitas like EK1MD, HL1BJ, MD2AC, MF2AA, PK2SS, VK4SL/-VR1, W4 2EJV/PK3 7LZJ/C6 and ZC6UN. Ten-meter men refuse to toss in the midyear towel, matching modulation with PJ5KO, PK4KS and YR5AC. Divers developments on the DX front: NY4s become KG4s with disconcerting suddenness. FB8AB of 1930s DX fame is said to be set to initiate postwar ham activity in Madagascar. Israel's joining the ARRL DXCC Countries List causes some commotion because of border technicalities. Jeaves bedevils the boss with eerie QRM. Pictures of HA4SA, Swiss DXCCers HB9a CX J BX and FE button up the offering. **QST**



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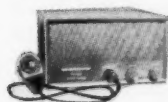
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National HRO5	\$ 99.50
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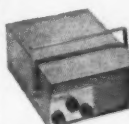
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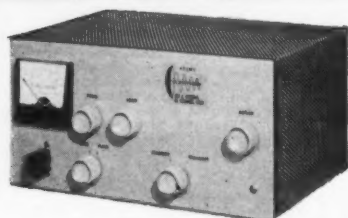


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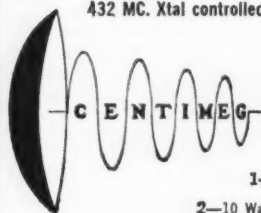
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The World above 50 Mc.

(Continued from page 71)

K2ZSQ, Rahway, N. J.—Making OBS transmissions on 50 Mc. daily at 1430, beam NE.

W4FNR, Ft. Lauderdale, Fla.—Have heard 50-Mc. signals on several occasions recently when there was no evidence of sporadic-E skip on 28 Mc.

K4KWW, Chatham, Va.—Simple grounded-grid r.f. amplifier (schematic in Fig. 1) will make big improvement in converters or receivers that are low in gain at 50 Mc.

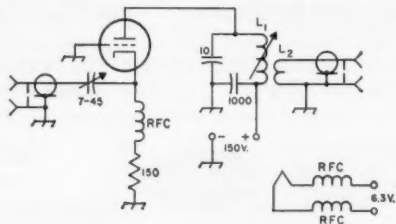


Fig. 1—Schematic diagram of the grounded-grid r.f. amplifier for 50 Mc. used by K4KWW. Tube may be 417A, 6J4, 6AM4 or any similar v.h.f. triode.

L₁—11 turns No. 28 close-wound on 1/4-inch iron-slug form.

L₂—3 turns wound over B-plus end of L₁.

RFC—Solenoid v.h.f. choke (Ohmite Z-50).

Parts were assembled on flat aluminum plate, with no shielding, but no trouble was encountered with oscillation. Adjust L₁ and C₁ for best signal-to-noise ratio. Tube used here was 417A, but any small high-G_m triode will work well.

W4RMU, Jacksonville, Fla.—Increased interest in 50-Mc. ionospheric scatter makes possible many QSOs without prearranged skeds. Following stations worked during May by this medium: W2YYI K2RRG (Many contacts) W9EEY W1CLH W8UML W1LGE W8GHX W2YNN K3EH W3ASD W3OMG W4LTU.

Built 13-element Yagi for 220 Mc. When using pierced boom for mounting elements the boom diameter has appreciable effect on element length at this frequency.

K5TQP, Albuquerque, N. Mex.—Still looking for long-distance skeds on 144 Mc. Would be glad to hear from anyone having good equipment and antennas, for c.w. skeds.

W6KAR, Ojai, Cal.—San Diego now has repeater on Monument Peak northeast of city. Input is 147.18, output 145.38 Mc.

W6OYM, Sherman Oaks, Cal.—Transmitter hunts gaining in popularity. Beams universally used on 144 Mc.; proximity detection methods on 50. Need for greater care in driving in these events is obvious.

W6WNN, La Mesa, Cal.—Very short skip on 50 Mc. June 10. Heard all call areas except W1, with stations as close as Reno coming in well. Called XE2WC, Tijuana, and got him on, with resulting tremendous pileup of northern W7s.

W7MAH, Reno, Nev.—Sporadic-E skip observed 8 days in May. All call areas heard. Completed 15-element long Yagi for 144 Mc. Hope to work Bay area on 144 Mc. as has been done regularly on 50.

More Sporadic-E DX on 144 Mc.—Observing very short skip on 50 Mc. near the midpoint of the path to Florida. W5SFW, Amarillo, Texas, called W4GJO, Sarasota, on 50 Mc. at 1430 EST, June 28. Changing to 144 Mc., W5SFW was heard at once, 87, and a two-way on 144 Mc. followed immediately. W4GJO reports that W5SFW peaked over 80. The path remained open for about 15 minutes.

Later that same day, W4GJO worked HH2W, Port-au-Prince, Haiti on 50 Mc. It was the latter's first 50-Mc. QSO, and probably the first HH-W on 50 Mc.

On July 4 at 1615 EST, W8GTK, Rochester, Mich., noticed very short skip on 50 Mc. (St. Louis stations working Indiana) so he went to 144 Mc. At 1645 he heard W5SFW working VE3AIB and later VE3HW. W4LTU, Springfield, Va., heard W0IC, Denver, on 144 Mc. 1705 to 1715 EST, a distance of 1425 miles.

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Happenings

(Continued from page 67)

B. Award a "Radio Pioneer Certificate" to amateurs licensed prior to April 6, 1917, in lieu of issuing them Extra Class licenses, but with all the privileges of the present Extra Class.

C. Change the permissible maximum power input of amateur stations by, generally speaking, reducing the limit for all classes of licensees of amateur stations except those holders of Extra Class licenses (either Radiotelegraph or Radiotelephone) or "Radio Pioneer Certificates" who would be permitted a maximum power input of 1000 watts.

4. It is unnecessary to repeat here the reasons, set forth in the aforementioned Memorandum Opinion and Order (see Mimeo 67785), for finding this proposal to be neither feasible nor in the public interest. However, while denying that petition, the Commission did concur with its objective: to restore a degree of prestige to the Extra Class. It was stated: "Therefore, the Commission proposes to issue a Notice of Inquiry to explore the possibilities of restoring meaning and prestige to the Extra Class license. In this manner interested parties will be able to file comments containing alternative proposals which might accomplish the purpose desired both by the petitioner here and by the Commission." It is noted that this statement speaks of "alternative proposals" and the Commission wishes to emphasize that the aim of this Notice of Inquiry is to receive possible solutions from interested parties which have not already been examined and found unacceptable by the Commission.

5. Any interested person may file a written statement or brief setting forth his views on this matter on or before September 15, 1959. If, as a result of this Notice of Inquiry, the Commission should subsequently initiate a Notice of Proposed Rule Making adequate opportunity will be afforded interested parties to file comments on any such proposal.

6. Pursuant to the provisions of Section 1.54 of the Commission's Rules, an original and fourteen copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION

Adopted: June 17, 1959

Mary Jane Morris

Released: June 23, 1959

Secretary

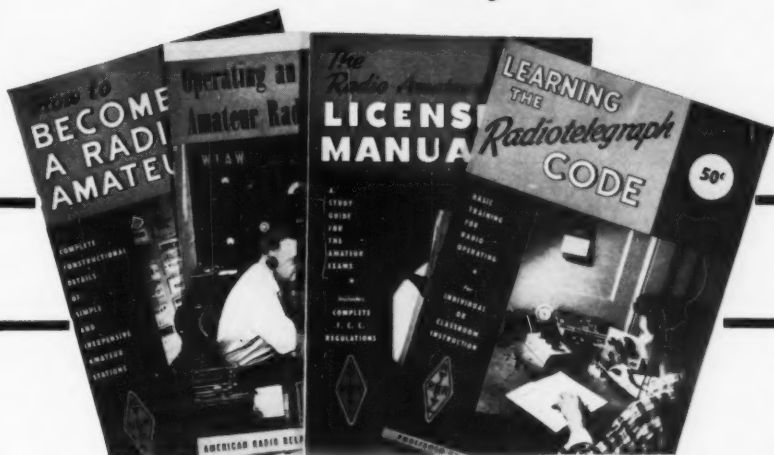
RACES EXPANSION

As mentioned briefly in this department last month, FCC has expanded, effective July 1, 1959, the frequency segments available for use by the Radio Amateur Civil Emergency Service. In its order the Commission noted a misunderstanding on the part of at least some of the individual amateurs who filed comments in the belief that the FCC proposal would withdraw such segments from normal amateur operation; the Commission took pains to point out that no frequencies were being excluded from normal amateur operation (see also page 9, April QST). The complete list of RACES frequencies which are now in effect appears on page 166 of February QST; we tabulate herewith only those which are newly available to RACES as of July 1:

For use by all RACES stations, in emergency areas when required to make initial contact with military units, also for communications with military stations on matters requiring coordination: 3997 kc. with 0.1A1 and 6A3 emission, and 53.30 Mc. with 40F3 emission.

For use by all RACES stations in continental U. S. only, with c.w. and f.s.k., and voice emission also when the segment is part of an amateur band where such emission is authorized amateurs: 3510-3516 kc., 3516-3550 kc., 3984-3990 kc., 7097-7103 kc., 7103-7125 kc., 7245-7255 kc., 14047-14053 kc., 14220-14230 kc., 21047-21053 kc. In the event of actual civil defense emergency, segments marked with an asterisk are available only during the initial 30 days of such emergency unless otherwise ordered. **QST**

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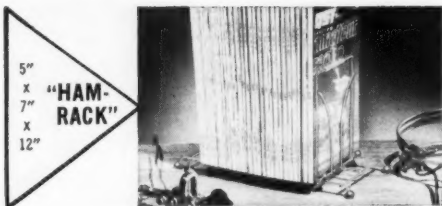
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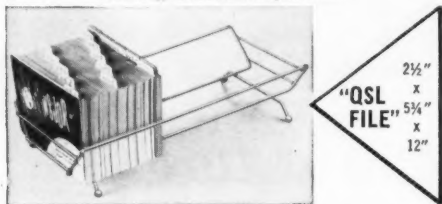
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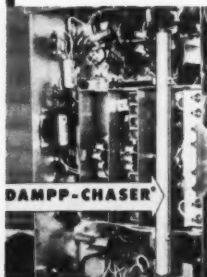
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VE/W Results

(Continued from page 81)

<i>Iowa</i>		<i>S.C.V.</i>	
K0DQI	60,919	W6JKJ	39,955
K0AZJ	30,324	W6RLP	27,779
K0INR	22,213	W6JFV	11,696
W0CSP	10,234	W6CLZ	6,318
K0CLS	6,498		
K0DPT	1,805	<i>E. Bay</i>	
W9WJD/0	1625	K6QHC	64,980
		W6IPH	24,548
		W6GEB	18,953
		W6KGV	16,245
<i>Kansas</i>			
W0VFE	19,169	<i>S.P.</i>	
W0HAW	18,519	K6OPI	63,031
		K6EIE	26,858
<i>Mo.</i>		W6WLV	18,950
K0ITF	37,363	W6YOM	8,772
K0JPL	33,140		
W0GAX/0	20,848	<i>Sac. V.</i>	
W0QWS	19,061	K6SXA	103,806
W0GBJ	13,126	K6RFT	4,874
W0BQM	650	W6DWJ	3,249
<i>Nebr.</i>		<i>N.C.</i>	
W0DW	17,328	K4HXF	50,684
K0KKM	12,888	K4LGI	28,519
		W4PLL	19,927
<i>Conn.</i>			
W1GYE	38,988	<i>S.C.</i>	
W1WY	34,602	K4MUP	1,083
W1TS	32,490		
K1CCA	30,238	<i>Va.</i>	
W1ODW	29,891	W4SHX	32,490
W1DDJ	28,808	W4FZG	30,216
W1MDO	24,368	K4OAG	22,743
K1AJJ	11,046	W4WSE	20,794
W1AMI	5,198	W4CQI	15,306
W1FYF	2,483	W4JLJ	13,646
		W4EWO	12,635
<i>E. Mass.</i>		W4SNH	10,108
W1SAD	18,844	K4RWH	2,816
W1FJJ	15,595		
W1MIX	13,285	<i>W. Va.</i>	
W1JEM	12,776	W8DIE	33,356
W1WTF	4,801	W8LSJ	25,017
W1COL	2,762	K8ELF	18,194
W1PLJ	2,437	K8DAV	6,137
K1DYL	975		
W1NJJ	650		
		<i>W. Mass.</i>	
		W1KGJ	26,786
		K1BZM	8,014
		K1ADR	2,737
<i>N.H.</i>		<i>Utah</i>	
W1FZ	26,967	K7CDX	11,047
W1CUL	12,707	K7AHM	9,097
<i>R.I.</i>		<i>N. Mex.</i>	
W1SKT	17,219	K5KEL	21,660
K1ANT	15,162	K5IAL	2,924
W1VBR	4,061		
		<i>Ala.</i>	
		K4SSB	36,551
		K4RJM	12,130
		W4KAC	6,931
		K4HPR	5,957
		W4DS	5,812
		K4SAV	5,415
		W4WOG	4,874
<i>Alaska</i>		<i>E. Fla.</i>	
KL7CDF	13,321	W4VPD	42,454
KL7MF	12,021	K4LDR	38,988
		K4KOD	15,415
		K4QHJ	8,664
		K4HOK	1,949
<i>Idaho</i>		<i>Ga.</i>	
K7BWV	5,632	W4BEY	57,020
K7CPC	1,526	W4LJD	15,162
		K4BAI	13,646
		K4KZP	7,148
<i>Ore.</i>		<i>Los Ang.</i>	
K7AWW	17,184	W6NZW	45,735
W7KMU	13,268	W6NKR	31,190
		K6SHJ	11,552
		K6KCU	10,108
		K6GZZ	8,339
		K6ICS	4,494
		K6KMM	4,332
		K6BEP	3,899
		W6UQC	1,789
		K6GFK	1,490
<i>Wash.</i>		<i>Hawaii</i>	
W7LEV	32,165	KH6IJ	7,834
W7AJS	29,728		
W7PQE	23,880		
K7BWL	20,956		
K7CHH	18,953		
W7ITX	15,595		
W7TRK	15,162		
W7RGL	15,108		
K7AST	7,798		
W7ZVY	4,061		
W7EVU	54		

(Continued on page 148)

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KN6EBL.....	325	K5PNP.....	18,053
W7QAP.....	6354	W5FTD.....	15,162
W7PUC.....	1083	W5TPZ.....	12,509
		W5UMP.....	8718
		So. Tex.	
WA6CEZ.....	11,265	W5LGG.....	75,053
		K5BSZ.....	17,328
		K5KWC.....	13,285
W6OUL.....	24,260	W5WZQ.....	8652
W6FYW.....	866	K5JCC.....	7960
W6DOP.....	217	K5JEH.....	7960
		W5MPE.....	5523
		W5JPC.....	5199
		No. Tex.	
K5MBB.....	21,891		

QST

Amateur Radio Invades

(Continued from page 66)

W3AAU, at her home just outside Philadelphia. Another typical set-up was perhaps a slight exaggeration, but showed Florence Collins, W3DBN, using a "Gooney-Box" in the kitchen while doing her ironing, talking to her husband who was mobile. The outside camera caught hubby in the car, and some very clever switching let the viewers watch and hear both sides of the transmissions. Florence stole the show with a parting remark to hubby to hurry home, "and don't forget a quart of milk!"

We next showed the DX operator's shack and were treated to a sideband chat with an amateur in Canada. Wes Sammis, W2YRW, manned our traffic set-up, and since a traffic net is a hard thing to come by in the middle of the afternoon, we taped one in advance and used the sound on the air, while Wes faked a bit, and did a good job. Woody Haldeman, W3PST, the Philadelphia County Civil Defense Radio Officer, and ARRL's George Hart, W1NJM, shared the next spot in discussing briefly the ham's part in emergency work. The outside camera again caught some action in the form of the Philmont Club's mobile unit wheeling into position. Ray Wilkins, K3BRL, manned the shop set, where we depicted an experimenting ham. Ray gave us some fast talk on sweep generators, but convinced everyone that a ham is also important as a technician. John Severn, W3ZSJ, came equipped with a tape recorder and a tape of some satellite reception to demonstrate the activities of amateurs in the field of satellite tracking. Frank Sandorra, W3TUU, brought along some of his radio-controlled aircraft and was caught in action by the ever-busy outdoor cameraman.

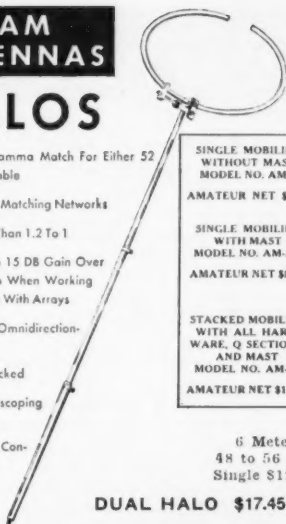
The entire presentation was necessarily very brief and perhaps seemed a little sketchy, but in half an hour one cannot possibly cover everything about ham radio and do it complete justice. Our only hope was that we interested some in our hobby. Also, it was our desire that the uninformed be better informed, and thereby become more tolerant of the neighborhood ham. It was with this thought in mind that we purposely selected adult operators to appear on camera, so that the general picture of a ham operator would be one of maturity.

There are those who say that K2MBT did a

(Continued on page 150)

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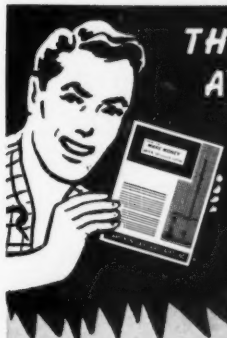
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very smooth job as narrator, and that his ad lib presentation was a credit to ham radio. But Dick himself will tell anyone who asks that until the whole thing was over, radio experience or not, he was one nervous boy!!

Well Worth the Effort

What about the results of our efforts? We had spent about twelve weeks preparing for thirty minutes on the air. The total of man-hours that went into the preparation has never been fully determined. The station seemed very pleased. They have received a good mail response from the show, and their telephone switchboard was jammed for the better part of an hour after the show with compliments and thanks for a really worthwhile production. Later information comes to us that from as far away as Europe congratulations have come in for the effort we put forth. So all in all we feel that the job was well worth the effort we all put in. Amateur radio needs to be put before the public now more than ever, so we heartily encourage those in other areas to do the same as we did here in the Philadelphia area. The public needs to know more about the Wonderful World of Ham Radio — truly one of the world's most perfect hobbies! **QST**

Correspondence

(Continued from page 82)

not make a go of it, until I flatly announced that I intended to answer no midwestern calls. After that I had to work through snide remarks, insults and deliberate efforts at QRM for another 20 minutes before we were finally able to complete the contact. Similarly, on the rare occasions when I can try short-skip contacts with Arizona and adjacent states I have trouble with Californians and Texans, even though these states are easy to work from my location.

We "rare-state" operators work hard at filling requests for contacts with other states. I work stations at the rate of 30 to 40 an hour when conditions are right. QSL cards go out by the hundreds, giving me a postage bill that would stagger many hams, and it doesn't leave much time for friendly ragchews. I enjoy this popularity most of the time and will do my best to work anyone who needs New Mexico: all I ask is common courtesy and consideration.

— Frank Green, K51QL

HOW'S THAT?

5911 Chester Avenue
Philadelphia 43, Pennsylvania

Editor, QST:

Please tell me — what means "fixed portable" we hear so much on 10 meters?

— John P. Stowe, W3JQE

Geneva — 1959

(Continued from page 59)

the Secretary of Commerce had been given no authority whatsoever to enforce any wavelength assignments other than those set forth in the law itself. When the short waves first opened up, every service in the country — Government, commercial and amateur — could operate anywhere it wanted to in the short-wave territory, and did, with increasingly chaotic results. The 1924 conference represented an attempt to solve an otherwise impossible situation by means of mutual agreements to be voluntarily respected by all services until the law could come along and catch

(Continued on page 152)

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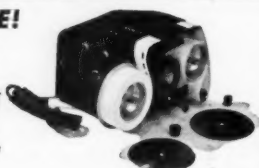
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up. Everybody was perfectly aware that the "regulations" resulting from these agreements were not binding, but everyone knew also that some sort of order was essential in order to continue operating at all.

In many respects, this 1924 Hoover Conference was a modern international radio gathering on a small scale. Every domestic service was present pushing for all the short-wave territory it could get. The "shorts" were so brand-new that nobody had a clear idea of which waves were good for what; for that reason, everyone was out to get all that could be got, from one end of the scale to the other. Without going into detail (details in past QSTs for those interested) we may say that the outcome of the 1924 meeting was amateur bands as follows: 1500-2000 kc., 3500-4000 kc., 7000-8000 kc., 14,000-16,000 kc., 56,000-64,000 kc.

It was recommended that the Supervisor of Radio decide whether one license would permit the use of all these bands or whether multiple licenses would be necessary (it was later agreed that one would do the trick). Incidentally, it will be noticed that we were embarked on the idea of maintaining a harmonic relationship, so far as possible. The omission of any ten-meter assignment in the table, however, is not accidental; there was no assignment. The reason for this is that the Hoover series did not extend as far as the ten-meter territory. The 5-meter assignment was incorporated by special request solely because of the fact that a small group of experimenters wished to work there; the same reason applies to a subsequent 400-401-Mc. assignment for beam experiments, made shortly after the conference by the Department of Commerce at the special request of ARRL.

Other bands were assigned to the various other services which wanted space in the spectrum and which, remember, were just as much entitled to it as we were.

Since the 1925 conference did nothing to alter this general set-up we will skip over it and say that during 1924, '25, and '26 we here in the U. S. operated in the 1924 bands. By mutual agreement, of course.

In the meantime, Congress was being bombarded with requests and entreaties for a new law but was still doing nothing about it. How long this might have gone on no one knows had it not been that in 1926 the so-called "breakdown of the law" came about when a broadcast station which didn't like its assignment on the mutual-agreement basis made a test case resulting in a court opinion denying the Secretary of Commerce the authority to compel stations to observe any specified wavelength assignments (outside the very broad limits previously mentioned in the basic law). Overnight, all the existing "regulations" which specified definite wavelength assignments were rendered inoperative. Any other service that wanted to could have started to operate in "our" bands, for instance. It was a tense moment! Would all the radio stations in the

(Continued on page 154)

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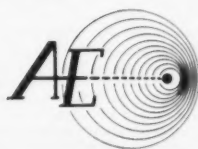
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country jump their assignments? Well, they
could have, but most of them didn't; almost
unanimously, the radio world in this country sat
tight on its Hoover agreements, one of the most
remarkable spectacles radio regulation will
probably ever see.

However, this upset of the 1912 law had the
effect of spurring Congress to the realization of
the absolute necessity for a new law and so in
1927, the same year when the Washington Inter-
national Conference was held (but before that
affair), Congress passed the Radio Act of 1927
which not only defined amateurs for the first
time in any law, foreign or domestic, but set up a
Federal Radio Commission to administer radio
matters and gave it the necessary authority to
make regulations that would stick. As soon as the
commission was created, we got it to assign to us
the same wave-bands that had been agreed upon
at the 1924 Hoover Conference, except that we
had a 10-meter band included.

We are now almost through with the story.
Discerning readers may at this point ask how we
could get the Hoover bands assigned to us under
the 1927 U. S. radio law when our Government
was a party to (and ratified) the 1927 interna-
tional treaty which gave us somewhat different
territory — specifically, narrower bands at 7 and
14 Mc.⁷ The answer is that the 1927 U. S. law
went into effect before the Washington conference
was held and, further, that the terms of the Wash-
ington conference did not go into effect until
January 1, 1929. Until January of 1929, therefore,
our Government let the wider-band specifications
stand as U. S. law. On January 1, 1929, however,
it immediately amended our amateur regulations
to conform strictly to the international agree-
ments.

From that time to the opening of the second
World War, through both national and interna-
tional regulations, we retained the bands first
set up for amateur use in the Washington Inter-
national Treaty of 1927.

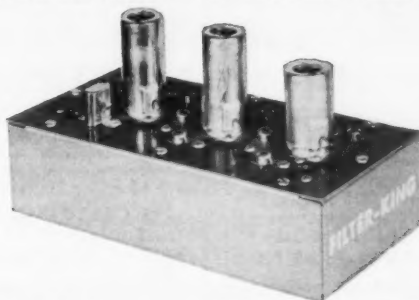
This concludes a very rapid and rather brief
résumé of our amateur progress in terms of legis-
lation. It is, needless to say, impossible in such
an article as this to go into detail or to describe
adequately the tremendous part played in all
amateur matters by the ARRL ever since the
League's formation.

In the next issue will appear a brief outline of
the steps leading up to an international confer-
ence, a description of how such a gathering does
business, and a résumé of the preparatory work
which has been going on in this country looking
to our participation in the Geneva Conference
which opens in August.

QST

⁷ Although the U. S. government's proposals for amateurs
at the 1927 international conference were for the same bands
we were using domestically as a result of the Hoover agree-
ments, practically every other nation was bitterly opposed to
amateurs having any appreciable bands — or even any
privileges at all in the high-frequency spectrum. The bands
we got represented the only compromise our Government
could secure in the face of an almost unanimous effort on
the part of the other governments to bar amateurs from the
h.f. spectrum entirely, or permit it only under the most
restricted conditions, such as use of dummy antennas, etc.

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Fig. 21-19—Transistor circuit-checker or "grid-dip meter" covering 3 to 40 Mc. in five ranges. The circuit and battery power supply are contained in the . . .

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THIS device isn't exactly a grid dipper, but it will do the same things, and without dangling a.c. cords. It's a handy transistorized circuit-checker that will have many uses in your station. Complete details on construction appear in the 1959 *Radio Amateur's Handbook*. And that's not all! The twenty-five chapters of this useful book cover the entire field of amateur radio communications: receivers, transmitters, v.h.f., antennas, mobile, operating, etc. Get your copy of the big new *Handbook* now: 746 pages, over 1350 illustrations, charts, diagrams and tables.

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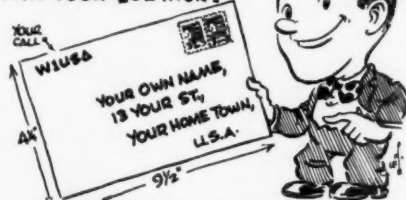
4799 SHERIDAN ROAD, CHICAGO 40, ILLINOIS
357 West Manchester Ave., Los Angeles 3, California

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

- W1, K1—G. L. DeGrenier, W1GKK, 100 Gallup St., North Adams, Mass.
W2, K2—North Jersey DX Ass'n, Box 55, Arlington, N. J.
W3, K3—Jesse Bieberman, W3KTT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4—Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5—Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
W6, K6—Horace R. Greer, W6T1, 414 Fairmount Avenue, Oakland, Calif.
W7, K7—Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8—Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9—J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
W0, K0—Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
VE1—L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.
VE2—George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.
VE3—Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4—Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5—Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6—W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.
VE7—H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
VE8—J. A. E. Williams, VE8JW, P.O. Box 534, Whitehorse, Y. T.
VO1—Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
VO2—Douglas B. Ritecy, Dept. of Transport, Goose Bay, Labrador.
KPA—E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KH6—Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, T. H.
KL7—KL7CP, 310-10th Ave., Anchorage, Alaska.
KZ5—Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

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New! Telrex "Spiralray"

Extremely high-gain, high signal-to-noise, practically no fade, all radiation planes—horizontal, vertical or oblique! Ideal for scatter-wave, satellite, mobile or point to point work! 50, 108 and 144 megacycle models available

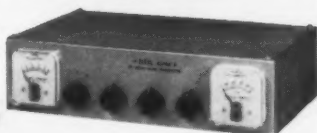
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THE NEIL BETA 6 SIX METER PHONE TRANSMITTER

- Two Tuning Meters Eliminate Bothersome Meter Switching
- Exceptionally Clean Modulation
- Ideal for Mobile or Fixed Station - only 3 inches high
B+ requires 600v @ 100ma; 350v @ 200ma (approx.)



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ALL ABOVE FEATURES PLUS BUILT-IN 3-POSITION CRYSTAL SWITCH
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BUILT-IN TRANSISTOR POWER SUPPLY

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STRICTLY FOR MOBILE 12v OPERATION • No External B+ Supply Needed
All features of the Alpha 6, 20 watt transmitter, but requires 12v DC only.

Beta 6, wired, complete with tubes and crystal \$125.00
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Alpha 6, wired, complete with tubes and crystal \$78.50

Alpha 6, kit, complete with tubes, crystal, construction book \$58.50
Fixed power supply, Alpha 6 .. \$39.50
As above, kit \$32.00
Fixed power supply, Beta 6 \$79.00
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Neil Mobileer \$159.00
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All transmitters available for 6 or 10 meters and 6 or 12v filament.

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Most Popular Amateur Receiver Ever!



HAMMARLUND HQ-110

Dual conversion. Full coverage of 6, 10, 15, 20, 40, 80 and 160 meter ham bands. 12-tube superheterodyne circuit. Separate linear detector for SSB and CW. Q-Multiplier. Separate stabilized BFO. Crystal calibrator, crystal controlled 2nd conversion. Auto response. Automatic noise limiter. A true amateur receiver. W4WL, Tenny Freck, will make good trade-in offers. PRICE \$249.00, S-100 Speaker \$14.95 extra.

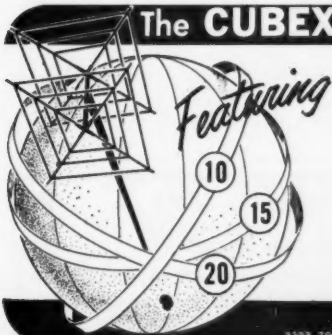
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Shelby, N. C.
Phone: HU 7-5171

The CUBEX MK III De Luxe 3 BAND QUAD

FOR 10—15—20 METERS



- HUSKY CAST ALUMINUM END SPIDERS
- HEAVY ALUMINUM BOOM-TO-MAST FITTING
- RUGGED 2" x 8 ft. TUBULAR ALUMINUM BOOM
- GAIN: 10 db on 10 and 15, 8 db on 20 • FBR: up to 24 db

Low Wind Resistance — Light Weight, only 27 lbs. — TV Rotor Handles — Low SWR — Pre-tuned Reflector Coils — No Stubs

The CUBEX MK III gives you 3 FULL SIZE, FULL EFFICIENCY, beam antennas with separate FULL WAVE driven elements on each band. All this in half the horizontal space required by a 3 el, 20 mtr. beam.

WRITE FOR FREE BROCHURE "MK"

CUBEX COMPANY

3323 TONIA AVENUE

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only
\$67.50
F.O.B. Factory
Other Models
from \$49.50

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As *QST*s get older, they become more valuable. Are your 1959 copies scattered sloppily about the shack? If so, why not file them neatly. The best way to accomplish this is to place them in sturdy, good-looking *QST* Binders.

Finished in reddish-brown fabrikoid with stiff covers, each Binder holds twelve issues of *QST*, opens to any page and lies flat. Your copies are protected and always available for easy reference.

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Registers Fractions to 99.9 Turns
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TUNERS, fine tuning gear re-
ducers, vacuum and other multivari-
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2 has 2 1/2" dial — 1 1/2" knob. TC 3 has 3" dial —
2 1/2" knob. Black bakelite.
TC 2 \$4.20 — TC 3 \$4.75 — Spinner Handle 75c extra

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Full size (8 by 10) glossy prints of equipment described in *QST* by staff members (only) can be furnished at \$1.50 each. Please indicate the *QST* issue, page number, and other necessary identification when ordering, and include full remittance with your order — we do not bill nor ship c.o.d.

N. E. Division Convention

(Continued from page 10)

Sunday afternoon.

The entire facilities of the beautiful new Statler-Hilton Hotel will be devoted to the convention. Parking space will be plentiful, and a special late checkout time will be provided for convention guests. Charter bus service and guided tours of ARRL Headquarters and the Maxim Memorial Station, W1AW, throughout Saturday.

Outstanding speakers have been engaged for the technical programs and general sessions. ARRL will be represented by President Dosland, W0TSN, and several members of the Headquarters staff. Banquet toastmaster: George Bailey, W2KH, former League President, and long-time leader in amateur affairs. Special facilities and program for the ladies. Gala Saturday-night party, with dancing to the famous Landerman Orchestra.

Hotel and convention registration forms were mailed to New England ARRL members during July. These should be returned as soon as possible. Amateurs from other areas are cordially invited, but advance registration is recommended. Write Harold E. Flagg, W1RVZ, 80 Cedar Ridge Drive, Glastonbury, Conn. Prices: Admission and banquet — \$8.50. Admission only — \$4.00. At door: Admission only — \$4.50. Banquet, if available, \$5.50.

Talk-in station, W1NEM/1, on 75, 10 and 2 meters.

COMING UP! THE FORT WORTH HAMFEST October 24-25

Biggest and best in the Southwest

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Fort Worth 1, Texas, for details.



Known World-Wide by its Audio



Globe King 500C

Built-in antenna relay, built-in VFO, separate power supply for modulator. Commercial type compression circuit. Grid block keying for signal clarity. Pi-Net matches most antennas 52-300 ohms. Optional crystal operation. SSB input & operation with 15-20w external exciter. 31x22x14 3/4" cabinet designed for TVI-suppression.

Wired & Tested:
\$795.00

Completely Bandswitching, 10-160M, 540w AM & CW, 700w max. on DSB or SSB (PEP), with 15-20w external exciter.

New Citizens Broadcaster

CB-100

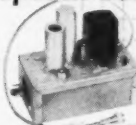
**11 M TRANSCEIVER
FOR USE BY ANYONE
NO EXAMINATION
Just fill out FCC Form 505**

Complete with
Xtals. for One
Channel & Mike
\$129.95



For home, office, car, boat, field, etc. 115VAC or 12V mobile. Exclusive 3-channel selection switch and button light indicators. Squelch control for muting background noise. 10-tube receiver/transmitter, atal. controlled. AM modulated. Meets all FCC specs. Compact: 31x13x10 1/2"; 9 lbs. Carry handle for tilt stand or permanent mounting.

Speech Booster FCL-1

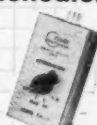


Wired & Tested:
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In Kit Form:
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Peak limiting audio preamplifier that clips and filters speech frequencies exceeding pre-set amplitude. Increases modulation intensity for most penetrating audio. Includes harmonic suppression. Plugs directly into Scout & Hi-Bander. Adaptable to other Xmitters.

Power Attenuator PA-1



Wired & Tested:
\$10.95

General purpose attenuator for excitors up to 70 watts input. Suitable to attenuate drive between many exciter-amplifier combinations. Standard coax input and output connectors. Tap switch to select any of three attenuation positions or straight through.

Tops on 6 and 2M

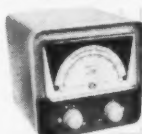


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Globe Hi-Bander

60w CW, 55w AM input on both 6 & 2M. Single control bandswitching. 4-stage RF section allowing straight through operation. Good harmonic and TVI-suppression. RF stages metered. Provisions for mobile use. 52-72 ohm coax output. New duo-band final tank circuit eliminates switching. Variable antenna loading control. Reserve power socket on rear chassis apron for accessories.

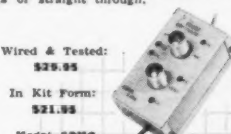


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Perfect zero beat. Built-in power supply with voltage regulation. Ideal for driving 6 and 2 meter transmitters. Temperature compensated for utmost stability. Excellent for use with Hi-Bander. Approx. 50V RF output in 8-9 mc. range. 13:1 tuning ratio, king-size tuning scale. Sideband stability.



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6M Converter

New, improved circuit for higher gain, greater signal/noise ratio. Printed circuit for ease in kit assembly. Models for fixed or mobile stations or 12 volt filaments. I.P. output of 10-14 mc. on fixed, 600-1600 kc. on mobile model. Highly stable, completely shielded, crystal controlled, complete with tubes, crystal, cables. 3x5 1/2 x 4 1/2".

90w CW



Wired & Tested: **\$74.50**
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Globe Chief 90A

Completely bandswitching 10-160M. Compact (8x14x9"), well-filtered, with built-in power supply. Pi-Net matches most antennas 52-600 ohms. Modified Grid-Block keying. Provisions for VFO input & operation. Can be converted to Fone with Globe Models UM-1 or SM-90 Modulators. Shielded for TVI-reduction. Kit contains all tubes, pre-punched chassis, etc.

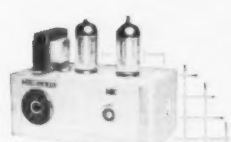
Modulates RF inputs to 100w



Kit: (less tubes) **\$34.95**
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Universal Modulator UM-1

Class A or AB-2 modulator, driver for higher power modulator, or PA amplifier. Matches output impedances 500-20,000 ohms. Carbon or crystal mike usable. Supplies up to 45w audio with proper output tubes. Provisions for addition of external meter for monitoring modulator cathode currents; for remote control of modulator. Perforated steel cover, \$3.00 extra.



In Kit Form only: **\$11.95.**

Screen Modulator SM-90

Ideal for use with Chief, but instructions for use with similar CW Xmitters. Permits radio-telephone operation at minimum cost. Self-contained. Printed circuit board, all parts and complete instructions.

Visit Your Favorite Distributor for Details!

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COUNCIL BLUFFS, IOWA

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provision of paragraphs (1), (2) and (5) apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to touch for their integrity or for the grade or character of the products or services advertised.

QUARTZ—Direct Importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOFOLORA used FM communications equipment bought and sold WBCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. WBYX, Troy, Ill.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

TRANSFORMERS (3) W2EWL Special. \$3.00 postpaid. SSB, latest diagram, template, 3 xfrms, die ceramic Elnac condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 QST), \$10.95 postpaid. Vialo, W2EWL, Denville, N. J.

COAXIAL Cable New surplus RG-54A/U, 58 ohms impedance—30 ft. prepaidd, \$1.00. Radio magazines, buy, sell, trade, R. Farmer, 3009 N. Columbia, Plainville, Texas.

ANTENNA 80-40-20-15-10, \$21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959.

WANTED: Battery receivers of 1920s, Eria, Acme, Radiola, Grebe, etc. Also UV190 thru UV200 tubes for electrical test. Buy or borrow. Grebe Reber, Green Bank, West Virginia.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, WARP, Purchase Radio supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. Normandy 8-5262.

SALE! NC-173 receiver, speaker, and manual, guaranteed good condx, slick iron grey finish. Bargain! \$125. R. A. Brown, 2551 Gentry Dr., Wichita, Kans. K0LEB.

MERCURY Turnstile: A horizontally polarized omnidirectional mobile or fixed antenna. "The most for two meter mobile." \$3.95-Mercury Enterprises, Box 2734, Granby, Conn.

WANTED: High quality military or commercial test equipment, receivers, transmitters, tubes, etc. Will pay cash or swap. Electroncraft, Box 399, Mt. Kisco, N. Y.

FOR Sale: QSTs, 1920 to 1936. Gepapa, North Grovesendale, Conn.

NAMEPLATES! Your call letters. Photoengraved, raised letters with black background, 2" x 1 1/16" x .025" brass plates, for rigs, test equipment, tool boxes, doorbells, etc. Three of same call, \$1.50. (Minimum order). Add'l. of same call, 35¢ ea. Postpaid. Taxpadded. Evert Laboratories, 235 E. Jackson, Lansing 6, Mich.

WANTED: All types receivers, transmitters, test equipment, telephone equipment in trade for new Hallcrafters, Hammarlund, Johnson Ranger, Valiant, National, Fisher, Hi-Fi 100V, etc. Write or phone: Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048).

HEATH Kits assembled, fifty per cent of the cost of kit, plus postage. Send kit or money for kit. I'll bill assembly charge. Robert Slisson, Rte. 2, Hartford, Michigan.

S.S.B. xfrms. exact set of 3 (hermetically sealed) for W2EWL Special, brand new, \$3.00 postpaid. New compact G-E 100-watt modulation xfrm, multi-impedance (10 lbs), \$6.25. new Elnac vacuum condenser, 12 µfd at 32 kilovolts, \$5.50. G-E Pyroval, 20 µfd at 1000 v.d.c. (330 vac. plus min. 4 for \$6.00; 4 µfd at 1000 v.d.c. (330 vac. min. 4 for \$3.50. Please include postage, no c.o.d.'s. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

SAVE time. Save Money! DX QSL's forwarded 2 each after membership. Free flyer "DX QSL Co-op," Box 5938, Kansas City 11, Mo.

QSLs? SWLS? Finest and largest variety samples, 25¢ (refunded). Callbooks (latest), \$5.00. Religious QSL samples, 10¢. "Rusty" Sackers, W8DED, P.O. Box 218, Holland, Mich.

C. Fritz Says "If it's worth a QSL, let's do it right!" QSL-SWLS. In '59 try mine! Samples 25¢ deductible. 1213 Briarclay, Joliet, Ill. QSLs, Glossy 2 and 3-colors. Attractive, distinctive, different, 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSLs "Brownie," W3CJL, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

QSL-SWLS, 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSL-SWLS, Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLs, Twenty exclusive designs in 3 colors. Rush \$3 for 100 or \$5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Hladensburg, Md.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25¢ refunded. K4LZ QSL 8, Summerfield, Fla.

QSLs, Reasonable. 10 days delivery. Catalog dime (coin). Dick Crawford, K6GJM, Box 607, Whittier, Calif.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN5ZMT, Creative Printing, P.O. Box 1064-C, Atascadero, Calif.

QSLs samples, 10¢. Refundable. Also Net Award Certificates and Membership cards. W3KPJ Press, 1806 Water St., Wesleyville, Penna.

QSLs Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL-SWLS, High quality, reasonable prices. Samples, Fob Teachout, W1FNV, 204 Adams St., Rutland, Vt.

QSLs, SWLS VHF'S SYL-OM's. (Sample assortment approximately 9½¢). Covering designing, planning, printer, arranging, mailing, eye-catching, comic, sedate, fabulous DX-attracting, prototypal, crazy, unparagoned cards. Rogers, K3AAB, 737 Lincoln Ave., St. Paul 5, Minn. Also klanorous, pulsating (Wow!)

QSLs. Get the best from DX, samples 25¢. 2 Kulik Street, Clifton, N. J. Shop telephone GRGregory 3-4779. Residence, GRGregory, 1-7885.

QSL-SWLS, 100 \$2.50. Samples 10¢. QSO File cards, \$1.00 per 100. Rusprint, Box 7507, Kansas City 16, Mo.

QSLs, Taprint, Union, Miss.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 3023, Bellair, Texas.

QSL-SWLS that are different. Colored, embossed card stock and "Kromekote." Samples 10¢. K3AIA, Turner, Box 953, Hamilton, Ohio.

QSLs: Send 25¢ (refundable) for samples. W6CMX, Schuch, 6707 Beek Ave., No. Hollywood, Calif.

QSLs, 3-color glossy, 100—\$4.50. Rutgers Vari-Typing Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLs samples, free. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs, SWLS. Citizen's band. Samples 10¢. Onondaga Press, Onondaga, Mich.

PICTURE QSL Cards of your shack, home, etc. Made from your photograph. 1000, \$12.00. Raum's 4154 Fifth St., Philadelphia 40, Penna.

QSL-SWLS. Citizen's Band. Samples 10¢. W4BKJ Press, 123 Main, McKenzie, Tenn.

QSLs, High quality, low prices. Fast service. Samples 10¢. Dave, 801 E. Maude, Sunnyvale, Calif.

QSL Special: \$1.75 per 100 cards, postpaid U. S. only. Glossy stock, red call letters, name and address. Green QSO information, etc. All orders mailed within 10 days. Free sample. Hobby Print shop, Umatilla, Fla.

QSLs, Samples, 25¢ refundable. E.P.C. 341 W. Broadway, Council Bluffs, Iowa.

QSLs, Samples, dime. Printer, Corwith, Iowa.

QSL-SWLS, Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

QUALITY QSLs. Samples and prices, 5¢. Best deal around. Savory Press, 172 Roosevelt Rd., Weymouth, Mass.

QSLs, 4 colors, glossy cards. Brilliant sparkling inks, 100, \$3.50, Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSLs, Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

SEND \$3.00 for 200 beautiful glossy QSLs. Samples free! Bolles, 7701 Tisdale, Austin 5, Texas.

QSLs, Cartoons, comics, something different. Samples, 25¢. Chris, W0PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLs, rubber stamps, reasonable prices, nice designs, samples dime. Stan, W2DJH Press, 19 Elm, Warrensburg, N. Y.

RUBBER stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

QSLs, Stamp brings samples, Eddie W. Scott, W3CSX, Fairplay, Md.

QSLs, SWLS. Samples 10¢. Onondaga Press, Onondaga, Michigan.

QSLs! Screen print up own. Easy. Details, WAT, Box 128, Brecksville, Ohio.

QSL-SWLS. Samples 10¢. W4BKJ Press, Wilson, Main St., McKenzie, Tenn.

QSL-SWLS, 3-colors, 100 \$2.00. Samples, dime. Bob Garra, Lehighton, Penna.

RUBBER Stamps: Why wait for cards? QSL with rubber stamps. Sample impressions, immediate delivery. Kay, K2UKQ, Blanchet Rubber Stamp Co., 21 Lincoln Ave., Orange, N. J.

COMPLETE File QSTs, 1915-1951 for sale. Landa, Clayton 2, Georgia.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply, Inc., 506 510 Kishwaukee St., Rockford, Ill.

"PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades. Send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA!" BCX-1, 73, Bill Harrison, W2AVA, 225 Greenview St., New York City, N.Y.

BARGAINS: Reconditioned and fully guaranteed, HQ-100 \$139.00, HQ-129X \$158.95; HF-33 new Demo, \$550.00, Heath Q Multiplier \$8.49, NC-300 \$279.00; KWM-1, 75A1, 75A2, NC-183D \$289.00; Globe Chief 90 \$44.00; Super PRO 894.50; Globe Scout 680 \$89.95; HT-18 \$39.95; RME-84 \$59.95; Lyseo 600 \$59.50; Knight 50 watt \$29.50; National SW-54 \$34.95; AF 67 \$139.00; PMR 6A \$79.95; Harvey Wells T-90 \$128.95; Globe King 275 \$179.00; Central Electronics 20A \$189.00; Side Hand slicers \$59.00; Heath AT-1 \$22.95; Hallicrafters 8-53 \$49.00; KWS-1, Morrow MBR-5 \$159.00; MRS 60A \$159.50; DX-20 \$29.95; NC-173 \$129.95; NC-125 \$139.50; NC-88 \$22.95; 32V3 \$450.00, 32V2 \$349.00; Globe King 500A \$425.00; HQ-100XA \$169.95; \$109.99 \$179.95. We trade new and used. Write Ken-Eds Radio Supply, 428 Central Ave., Fort Dodge Iowa, or 128 - 31 Street, Cedar Rapids, Iowa.

SALE: 20A and BC458 VFO with 10 mhz conversion kit, \$195; Elmac A54H, \$80. Both without a scratch. Katona, 1433 Liberty St., Trenn, N. J.

DX Transmitter with push-to-talk, all new tubes. Want to hear it working? Contact KWOLW, Noble, Gilman City, Mo. On 40 meters after ten PM Central Time. The Price: \$179.50, f.o.b. Will ship.

FOR SALE: RME 4350 dual conversion receiver. Brand new condition. Bruce Hobson, 1902 Asylum Ave., W. Hfd. Conn.

DELUXE Call Letters: engraved polished black phenolic laminate, 2 1/4" white letters on 3 1/2" x 1 1/4" x 1/4" beveled blank, \$1.75P. P. J. Mude, W8LWV, 3701 Germaine, Cleveland 9, Ohio.

COLORADO Ham Directory. Over 2000 amateur cross indexed by call, name, QTH with phone numbers, 64-pages, \$1.00 postpaid. Denver Radio Club, Box 356, Denver 1, Colo.

304TL Brand new Elmac, in orig. box, \$23.95, Mark Sternheimer, 3816 Hickory Rd., Richmond 25, Va.

FOR SALE: Hallicrafters HT32A, HT33A, SC-101. In original cartons, never used. Real sacrifice. C. R. Peyton, Box 343, Marietta, Ohio.

HEATH CO. Mohawk receiver, Apache transmitter and SP-10 Sideband Adapter. Used 30 hours. Best offer. Delivered anywhere in N. Y. state. K2HCD, Hilton, N. Y. Carl G. Thoreson, 35 Haen St.

COMBO HT32, HT33A, \$1100; KWS-1 \$1375. Write for an excellent list of good buys. Wanted, an "H and R Handygun." This is a single shot target pistol with a 12-in. barrel. Will swap. W2ADD, BACK Issues QST-CQ bought, sold. Tagan, Radio Co-op, Box 5938, Kansas City 11, Mo.

SAVE On Electronic, Radio and Communication Components and equipment for Hams and commercial use. See thousands of parts in stock - many more coming in daily - too numerous to catalog, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse, Electronics, 1206 S. Napa St., (at 31st and Grays Ferry), Philadelphia 46, Penna., or phone Howard 4-4645.

TOWER Wanted: used, 50 to 80 ft. steel tower of the crank-up type which will accommodate a Telrex triband beam and Ham-M rotor. Will be willing to pay shipping if within New York area. K2BLI, 67 Drexel Hill Drive, Summit, N. J. Phone CR 3-0440.

COOL California Kilowatt final and 810 modulator; two 2000 volt amp. supplies plus regulated bias, de-TV17 complete with five meters and vertical rack mounting, 8000s can be driven with ARC-5, DX-100, 32V, Viking II, etc. Free delivery within 150 miles of San Francisco, no trading. Write for pictures and simplified schematics: \$219.50, K6HVQ, 2019 Mira Vista, El Cerrito, Calif.

HAMS! Learn Calculus. Powerful mathematical tool. Easy practical lessons. First four \$1.00. Matheo, 4256-2 Mimor, Cincinnati 17, Ohio.

SELL: Globe King 400B, 10-20-40 meter coils, World VFO, extra pair V70Ds, 5514s, vy grid condx. Express collect, \$265.00. W9RQT, 204 So. 11th St., Belleville.

WANTED: Radio gear of the 1920s: UV206 1 KW tube, Remier Infradyne, untuned R.F. transformers made by Aemco, All-American, Atwater-Kent, Branston, Donagan, Dubilier, DX, Eria, Federal, Marle, Miller, Mu-Rad, Rasla, Savannah, Sterling, etc. Buy, borrow or trade. Grote Reber, Green Bank, West Virginia.

KEYS for Electronic Keyers, the new Elkey, attractive, precision made, 3 1/2 x 5 in. black cast base, 3 1/2 in. chrome finished solid brass construction. Order today! Santa Fe Park near Chicago. See construction, silver contacts. A first, \$15.50 prepaid in U.S. Card for details. Pouel Electronics, R. L. Pouel, W2ATJ, Box 181, Babylon, L. I., N. Y.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Globe, Harvey Wells. Our twenty-second year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

SACRIFICE! RME 4350 revtr., \$175. Better than better condx. W1GFE, c/o ARRL.

TORIODS: Unceased 58 mhz. like new. Dollar each. Five, \$4.00. P. P. DaPaul Co., 101 Starview, San Francisco, Calif.

SILVER Anniversary Hamfest of Hamsters Radio Club will be held Sunday, August 9, 1959, at Santa Fe Park near Chicago. See July QST Hamfest Calendar or write Betty Sandberg, W0STR, 2957 N. Monitor Ave., Chicago 34, Ill.

SELLING NC-98, without speaker, no modifications, exceptionally clean, stable, \$90. F-9. Want: UTC 8-49, 5-37, 8-38, G, H, J, AB coils for HRO-60, 6 ft. enclosed rack, W2DXI.

INSTRUMENTS Wanted: used, A. C. models, complete with tapes. For use in Amateur Radio class. State age, condition and price. G. E. Taylor, VE3EDG, 2835 Isabella St., Ft. William, Ont., Canada.

HAMMARLUND PRO-310 factory reconditioned. Make an offer! Will consider as part payment on good 32V3. Douglas Stowe, W6QWJ, 2553 Nipomo, Long Beach 15, Calif.

FIFTH Annual York County Hamfest, August 23, 1959. Contact John Zett, W3FLD, 2740 Grandview Ave., York, Penna.

KW1 and spare tubes, cash on the line. Take it away for \$200. HT32A, brand new, never used; \$595. H. Langemann, W2LBSJ.

4132's, used but guaranteed good, \$15 postpaid. W5AXI 4, 10419 65th Ave. North, Larch, Fla.

SCR22 with 12V dynamotor, remote control box control cables. Gud condx. \$30. Bert Lenny, W7HBC, 343 Bannock St., Malad City, Idaho.

SELL: KWM-1 and AC power supply, like new, with original packing boxes, \$750 or best offer. TA-33 JR 3-el Tribander, \$40. K4EX, Roger, 2644 Fisk Rd., Montgomery 6, Ala.

FOR SALE: DX-40 in brand new condx, \$55; Heathkit VFO brand new, \$16; a Hallicrafters R-40D spkr. brand new, \$15. You pay shipping. Bill Puterbaugh, 6120 Waverly, La Jolla, Calif.

VIKING Adventurer, modulator, model 122 VFO, all for only \$80. George Sears, 4732 F. Ave. NE, Cedar Rapids, Iowa.

FOR SALE: Collins receiver 75A-3 with spkr, 10'; transmitter, DX-100 with mike; set of baton coils for DX-100; Harvey-Wells TBS50D xtal control VFO; CDR rotor control for antenna; RME Remmy Prescaler; Signal Tone for code; Instructional code machine, 12 tapes for code; cubical quad antenna, lead-in wires, \$700. S. Bedell, 260 Autumn Ave., Brooklyn 8, N. Y.

NC-109 receiver, new, \$150; Heath M-3 scope, new, \$37.50; SR-100 sideband adapter (25 watts) modified, \$75; (needs minor adjustment) as is 2-304 TL, new, \$10.00 each. Command transmitters, receivers. The Parson, Box 763, Harlan, Ky.

NEW BC221 frequency meter with calibration book and manual, \$99.50. W9DFW, 101 Fairview, Jeffersonville, Ind.

HAMMARLUND HC10 converter, never used, Hamfest prize: \$100. E. J. McElroy, W1AEQ, 85 Fenton Court, Alexandria, Va.

WANTED: GPR-90 and G8H-1. May also consider another first cable" receiver. Also interested in KW power supply and crank-up tower from local source. Joseph Marshall, Jr., 22 Clare Drive, East Northport, L. I., N. Y.

BARGAINS: Reconditioned and guaranteed. Shipped on approval. Easy terms available financed by us. Hallicrafters \$38, \$29.00, \$85 \$99.92, SX99 \$119.00, SX96 \$159.00, \$40B, SX71, SX100, SX101, HT32, RME DB23 \$29.00, HE-10-20 \$49.00, VHF122A \$49.00, RME 4350 \$159.00; National SW54 \$29.00, NC98 \$99.00, NC183D \$249.00, NC300 \$279.00, HROS; GPR-90 \$349.00; Elmac PMR7 \$119.00, AF-67 \$129.00; Johnson Pacemaker \$299.00; Viking II, Ranger, Valiant, Thunderbolt; Heath DX35, DX100; Hammarlund HQ100, HQ110, HQ129, HQ140, HQ150, HQ160, HQ170; Collins 75A1, 75A2, 75A3, 75A4, 32V1, 32V2, 32V3, KWS1, KWSM1; Central 100, 20A, 600L; Globe Gomet; much other equipment. Write for list. Henry Radio, Butler, Mo.

WANTED: 516F-1 AC power supply for KWM-1. J. Pritchard, 230 Beverly St., Titusville, Fla.

LEECE-NEVILLE 12 volt 60 amp. alternator, regulator and rectifier, new, \$55; Harvey-Wells R9-A receiver, almost new, \$60.00; KC34B-R receiver, instr. book and 10 and 15 meter xtal converter, 115 AC, \$55; LM-18 freq. meter, complete and clean, 115 AC, \$50. Oet. QST 6 meter xtr with 2 xtals, plate mod. and p.s. Works FB, Conn. KC453 converted \$12. J. Bryant, 46 Melrose Park, Norwalk, Conn.

BRAND new Moniscope Model B2, check your modulation, can be used on SSB or AM, \$50; Model 26 teletype printer, excellent shape, \$50; Model FRA teletype converter, converted to 455 KC, \$50. Al Blum, W2KRB, 101 Kristin Road, North Syracuse, N. Y. All items F.O.B. Syracuse.

DSB-100, less pwr xfmr, \$100. LA-1, \$100. K5TGJ, 4633 Cole, Dallas, Texas.

FOR SALE or trade: Communications receiver, NC-109, \$50 or Gonset 2 meter Communicator, K2MEM, 15 Pine St., Blue Point, L. I., N. Y.

OSCILLOSCOPE mumetal magnetic shield for 3BP1 series tubes. Just the thing for that modulation monitor, \$2.50 each. Relay 6V AC normally open 100W 115V 60 cycle contacts. Ideal for remote switching of power supply, etc. Guardian K-320 \$2.00 each. Linear Electronics Co., 109 Hammond St., Waltham 54, Mass.

COLLINS 310B, B&W turret, TVI suppressed, \$165; 455J-31 mechanical filter, new, \$40. 148C1 NBFM adapter, \$10. W8MGG.

FOR SALE: Collins 32V-2 excellent \$310; SX-71, includes CQ multiplier, just refurbished, \$105; F-6B, Elmac AF-67, PMR-7, mobile power supply, all-band whip. Going mobile. All inquiries answered. Might trade. Will ship E.O. K4LVH/7, 168 Bennett Park, Mountain Home, Idaho.

TRADE: 721 Remington cal. 270 rifle with Weaver KV scope, silencer, carrying case, plus Hi Standard Field King 22 cal. automatic 100 yd. rifle, 22 cal. 100 yd. scope, 22 cal. 100 yd. silencer. Trade both for DX-100, Viking II, SSB exciter or good receiver. K5QCP, Don Yarbrough, 810 West Ave. C, Lovington, New Mexico.

RCA 8TR3, cost \$240, used less than ten hours; tape counter three speakers remote control. The works for first \$100.00. Original carton. Pair 4-45A, \$5.00. Philadelphia area. Sry, no delivery. K2DKC, Tel. Normandy 3-8605.

FOR SALE: DX-40, 15 hrs., \$65; BC-342, \$45; both for \$100. KN4WR, Lee Ferris, RFD #1, Hendersonville, N. C.

BIG Gallon SSB Kilowatt, HT32 B&W L-1001-A husky 1/2 amp. 3600V power supply, \$750. W3YDF, Cheswick, Penna.

HRO Original. Continuous coverage 500 KC to 30 Mc. Handspend on ham bands. "An odie but a goodie." \$75.00. W2HXS, Lally, South Fairview Ave., Bayport, L. I., N. Y. Tel. Bayport 8-5782.

SELL: DX-20, \$30; National NC-188, \$130; B-1 balun coils, \$7; QF-1 "Q" multiplier, \$8; Bell 3DT 20-watt stereo amplifier, \$80; components "Jr." 3 1/2 rpm turntable, \$20; AG-A audio signal generator, \$30. All ham gear less than six months old, and in perf. condx. Will ship postage paid, KN8SRD/9, Bob Beades, 626 26 St., Cairo, Ill.

VARIABLE: Vacuum capacitors: Elmac VCC2-60-20, \$65; VVC 60-20, \$25. Unused. Robert Fenwick, W7VMQ, 3127 N. 17th Drive, Phoenix, Ariz.

WANTED: Inexpensive Ham gear receiver xmitter, etc. Fixed or mobile. Condition not important, must be cheap, commercial gear only. Ship to K6LJD, 2865 Warburton, Santa Clara, California. I will examine gear and send you a money order or return gear immediately. Please help me get a start. Please state price.

SELL: SX-100 w/speaker, \$225; Heath power meter, \$13; Heath VOX, \$23; Heath RF signal generator, \$15; RME MB-3 w/speaker, \$25. Communicator II, 12v. \$175. Will deliver within 50 miles. W8CZU, 19 Union St., Tiffin, Ohio.

PERFECT: unaltered DX-100, \$175; HQ-140X, \$165; will take small all-band receiver in trade. 2500 volt 2 amp. power supply on dolly, \$150; pair Bendix 140-170 Mc. handpaks sets, FM, \$125. Want: 6 Kc filter for 75A4. W9DSV, Box 87, Webster, Wis.

SELL: Complete 100 watt 6 M. rig, G2X power supply, modulator, 666 VFO, 4-el. beam, cables, etc. \$195.00; 6M Mobile, Gonsert III Commander, 6 to 40 James power supply, Gonsert 6M converter, whip and cables, \$180.00. All inquiries will be answered. J. O. Van Sieck, W3AKZ, 143 Virginia Ave., Uniontown, Penna.

COLLINS 75A4 with speaker, 3 Kc and 500 cycle filters. Late serial number, excellent condition, \$650; Viking Ranger factory-wired, tested, with Johnson low-pass filter, used very little, \$250; Telrex Model 20M-56-112 3-el. full size 20 meter beam, \$75; 40 ft. Rohn Pyramid type tower and TR 12 rotor, \$50. Mod. 80 Turner xtal mike, \$8. No trades! Allan Dreier, K9BEV, 1915 N. Ulman St., Appleton, Wis.

SALE: National HRO-60 receiver, XCU Calibrator, coils: A, B, C, D, E, G, H, J, AD, covering 60 kilocycles to 54 megacycles. In excellent cond. Steal for \$395. S. E. Lipsky, 64-85 Wetherole St., Flushing 74, L. I., N. Y. Tel. TW 7-5577.

GOING TO University of Arizona. No use for 6 meters. Sell Gonsert 6 meter Communicator III, \$200, excellent cond., not a scratch on it. Gonsert 6 and 2 VFO, brand new, in factory carton, \$40. Will sell both for \$240.00. Dana B. Wood, K6AHM, P.O. Box 301, Thermal, Calif.

VIKING Mobile transmitter, VFO and base load - six, Morrow Indicator MYL-50 with FS-1 indicator. Complete dynamometer power supply and control unit and all cables and manuals. For 6-V. Easily changed to 12-V. \$150 takes all. W6PYZ, 239 Mandalay Rd., Oakland, Calif.

SALE! Cleaning shack! Motorola two-way equipment, 147.5 Mc FM base station, mobiles, Old QSTs, CQs, T18-50-D with PS, \$80; FM equipment. Many more items. Send for big list. D. C. Hale, 635 South 21st Avenue, Maywood, Ill.

81X Meter ultra conservative Kilowatt final amplifier; pushpull 1000T or 6C21 triodes with spare. Half-inch copper tubing tank lines; fully shielded; No TVI this QTH. Requires 50 to 100 watts drive. Made 6 meter W.A.C. with same; with power supply, \$350; without power supply \$225.00. WA4CH, Sterling, Va.

FOR SALE: (1) Gonsert G77A xmitter with 3-way power supply mod.; (2) Gonsert G66B revr with 3-way power supply; (3) 5055; mike (1) 10 meter Hellwhip ant., (1) 75 meter Hellwhip ant., (1) body mount for Hellwhip ant., (1) Vibroplex key (new) mounting racks for Gonsert twins; twins used about 4 months in like-new condition. The whole works for \$500. Will ship. Call write or wire Noel Thomas, 5740 Oxford, Tel. ATlantic 2-9550, Des Moines, Iowa.

FOR SALE: DX-100, \$185; SX-99 w/spkr, \$125; Bud crystal calibrator, Dow-Key relay DKC-TR, VX-Leetronic Vise control, XM2 SWR bridge, CAL Concordal antenna, balun coil, variable low pass filter. This is new equipment. Best offer. Roger L. Gaxken, Box 184, Watson, Minn.

QSS Sulfate transmitter receiver, 80, 40, 20, 110V AC; transmitter 6L6, Triton, PI tuner loads anywhere, receiver 6 tube Superhet, 75 or best reasonable offer. David Wiesen, W2WHB, % ADEC, 210 Central Ave., Newark, N. J., Mitchell 2-2210.

MOBILE Ham's Battery troubles? Les Hay, W7JWD, Rt. 1, Winlock, Wa. has the answer to your battery troubles! This is genuine! No gimmix!

GONSERT 3066 6m converter, excellent cond., \$35; Lafayette R/C boat, F-208 R/C receiver, 4 watt Ace xmitter, and complete set of batteries, \$50. I'll pay postage. K9PSX, 4353 N. Morris, Milwaukee, Wis.

SALE: Collins TCS-12 AM and C.W., 1.8/12.0 Mc xmitter VFO and 4 xials 100 w; ARC-5 4.0/5.3 VFO xmitter; RME HF 10-20 converter; BC 453A QSR revr w/power. Need cash and 220 Mc. gear. K2UUR, 12 Georgetown Rd., Parlin, N. J.

SELL: Viking II with VFO and low pass filter. Best offer. Going to West Point. Jerry Harrison, K0JSH, Richmond, Missouri.

KWM-1, two power supplies, speaker, Master Mobile antenna, EV602 mike, \$700; KWS-1, exc. \$1275.00; TS-28 Synchroscope, \$35; K6LZT, 6324 Cleon Ave., North Hollywood, Calif.

GONSERT Communicator III, used two hours, \$250; Globe Scout 680 factory-wired, good, \$65. J. W. Priour, Jr., K5LXE, Ingram, Texas.

TELEX VHF beam owners: Federal T&R K200-ohm transmission line, near perfect match to driven element. Ideal for harness and matching sections to open wire. 15¢ per ft. 60 ft. Augusta while it lasts. W4ISS, #18 Monte Sano Apis., Augusta, Ga.

COLLINS KWM-1, cost \$820; DX Adapter, cost \$126; speaker console with directional watt meter, cost \$205; AC supply cost \$136; 12 volt DC supply, cost \$262; mobile mounting tray cost \$98; Electro-Voice 602 mike cost \$55; Bassett mobile 3-band antenna. Total cost \$1750, all in excellent condition for \$1250. W4AHG, 203 Valley Brook Drive, Falls Church, Virginia, Tel. JE 4-2105.

FACTORY-WIRED Ranger, like new cond., \$225.00; 20A and all-band VFO \$195; Tri-band 3-element beam, \$39; Elmac AF67, \$125; PMR6A, \$75; NC300C6 converter, \$25. K8BCT, Woller, 402 Hobart Road, Marshall, Mich.

WANT Old ham and foreign license plates: also want gud 6M xmitter or transceiver. K3HNP, 12 Darkleaf, Levittown, Penna.

GLOBE-SCOUT 680, \$125; Heath VF-1 and QF-1, and Hy-Gain trap antenna, \$225. Gerald Krieg, K6MJJ, 341 S. 69th St., West Allis 14, Wis.

KNIGHT Amateur Communications receiver for sale, With BFO, 8-10 multiplier, "Q" multiplier, AVC, AN-1, antenna trimmer, AF and RF gain, bandspread and matching speaker. In good condition but am buying a HQ-110 and don't need. \$125. J. T. Paulsel, 4012 Byers, Ft. Worth, Texas.

BC-348Q for sale. With power supply, Q5-ER and spkr., \$55. Allen Gordon, W3RCD, 86-11 Whitney Ave., Elmhurst 73, N. Y.

SELL: Johnson Wired Ranger in factory sealed carton, \$295; Johnson 10 watt audio amplifier, new, \$75; Collins 32V2, excellent, \$295; Johnson Rotomatic rotor, indicator and 100 feet of control cable, excellent, \$250; 1958 Johnson Y-50 outboard motor in factory-sealed carton, \$595; kilowatt, pp-4-400 air-cooled, shielded final, \$10 modulators, two power supplies, 13 meters, in 72" commercial Bud rack, on ball bearing castors. Needs wiring thru meters, over \$2400 worth of parts. First check for \$600 takes it. Absolutely must be seen to be appreciated. Chance of a lifetime! Walter George Bergman, Wellesley Hills 81, Mass. Phone Natick/Olympic 2-1310.

FOR SALE: Millen 90801 exciter xmitr, \$55; Millen 90831 modulator, \$50; excellent cond. K4MKR, Fred Morris, 411 Newberne St., Lynchburg, Va.

FOR SALE: DS8100 factory-wired and tested, new and never used, \$95. Hoffman, W8ET, 336 Canterbury Road, Bay Village, Ohio.

KWS-1 for \$1175, 32V3 for \$350. Both operating satisfactorily. WMB8 Radio, Uniontown, Penna.

SELL: National NC-183D receiver and 50 ft. telescoping mast. Reasonable. L. D. Chipman, W4PRM, 816 Melrose St., Winston-Salem, North Carolina.

LEECE-NEVILLE 6 volt 100 amp. system - alternator regulator and rectifier, \$45; also, Leece-Neville 50 amp. system, \$50; 12 volt 100 amp. system, \$85, guaranteed no ex-police car units. P.E. 75 D ca generator 2500 watt a.c. 120 volt, 60 cycle used 10 hrs., \$250. Herbert A. Zimmermann, Jr., K2FAT, 115 Willow St., Brooklyn 1, N. Y. Tels. 1-LSTER 2-3472 or Jackson 2-2158.

JACKSON 49er tube-checker and adpt. kit, \$39; Teletest CT-355 in-circuit capacitor, \$29; Precision E-200 sig. gen., \$29; Heath BE-4 bat. eliminator, \$19; B&K 500 tube checker, \$79; Eleo 352-K bat. gen., \$9; two Supreme 543 multimeters, \$19; Precision E-400 sweep gen., \$79; Isolation transformer 0-150 meter, \$19; Hydraulic wiring jig by Garfield, \$9.00; B&K 400 pic. tube rejuvenator, \$49. Frank Witmer, HQ. USATCA, Ft. Knox, Ky.

VIKING Mobile xmitr with VFO, \$85; Viking Matchbox, like new, \$45; DB-23 Preselector, \$34.50; Gonsert Triband conv., \$22.50; Gonsert Super Six conv., \$25; Heathkit AT-1 xmitr, \$25; Elmac AF-67 xmitr, \$125.00; Elmac PMR-4A revr w/pwr supply, \$99.95; Viking I xmitr, \$110; Viking II with Heathkit VFO, \$185.00; Heathkit DX-20, good, \$29.50; Viking Thunderbolt, like new, \$415; SX-25 good, \$52.50; RME 4350 with matching speaker, \$199.95; NC-300, like new, \$275.00; HQ-150, excellent, \$219.50; B&W #370 SSB rec. adapter, new, \$94.50; SX-101, good, \$269.00; HRO-50T bat. gen., \$109.00; B&W #325.00; Brown Electronics, Inc., Art Brown, W0IHZ, 1032 Broadway, Fort Wayne, Ind.

ALL Aircraft or ground radios wanted for cash. Especially wanted units made by Collins Radio. Communications receivers, transmitters test equipments needed. Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: New used \$33.5, large modulation transformers, and variable vacuum condensers. Have for sale used high power oil-filled plate transformers rated at 7.5 KVA, 220/2750 or 110/4375. Weichert approximately 400 lbs. \$195 F.o.b. Orangeburg, S. C. Clarence Jones, W4DTW, 144 Broughton S.W.

AT College sell SX-99 in excellent cond. Shipped prepaid express to first \$115 check. K3CFZ 4, 507 Palm Drive Southwest, East Point, Georgia.

NATIONAL NC-66, \$75; Ampex A-112 Monaural recorder, \$195; Heathkit EA-1 amplifier, \$10; H-16/U headset, \$1.50; all in like-new condx and perfect. F. S. Egert, W8FLL, 11833 Wisconsin, Detroit 4, Mich.

HRO: coils 0.400 to 30 Mc.; power supply; excellent! \$85.00; HQ-120-X, net. Revamped with new IF's and all new modulators, \$65.00; Forty dollar "Mon-Key", keyer, like new, \$15.00, 15 Henry, 750 ml choke, 10 K ins., 10.00; old Dodge generator for rewinding KW AC supply with instructions, \$5.00; QST 1942 thru 1957 by lot or per make. Offer Professional 50-watt exciter, regulated, 7Vd, 500 volt supply, 10 to 80 coils, \$25.00. Bud Walte, W2ZK, 46 Monmouth Blvd., Oceanport, N. J.

SALE: Excellent NC-183-D, \$250. W4AAV, 544 Main St., Medford, Mass. Tel. EXport 6-6172.

DON'T Fall FCC tests! Check yourself with a time-tested "Sure-check" Test. \$75.00; General, \$175; Extra, \$200. We pay the postage. Amateur Radio Specialists, 1015 Seventh Ave., Worthington, Minn.

FOR SALE: Prop pitch motor, Curtiss 24v., \$15; rec. mod. RD2 200-400 Mc., \$25. W4ACHH, 1015 Palos Verdes Dr. West, Palos Verdes Estates, Calif. Tel. Frontier 5-1539.

RECONDITIONED Equipment: New Guarantee: TONS of fixed station equipment! 75A1 \$265.00; 840 \$65.00; SX62 \$179.00; SX100 \$219.00; SX101 \$319.00; HQ140X \$179.95; HRO600T \$385.00; NC98 \$114.00; NC125 \$139.50; NC300 \$269.00; many speakers, slicers, calibrators etc. Inquire. Also have Hundreds of transmitters. MOBILE the inexpensive WRL way! Super-6 \$39.50; Super 12 \$54.95; G-66 \$149.00; Communicators \$125.00 up; T18-50's (specify low or high impedance microphone) \$59.95; Viking Mobile \$79.50; MHR-5 \$139.00; MR660 \$139.00; A54H \$95.00 AF67 \$139.00; PMR6A \$79.00; PMR-7 \$119.00; G77 \$80.00; ATC-1 \$59.50; MC-55 \$38.50; SRT-120 \$89.00; power supplies \$5.00 up. Terms, trials, trades. Leo - W0GFQ, WRL, Box 811, Council Bluffs, Iowa.

KITS Wired - any type. Custom-building. Reasonable, W4NBV, 4305 London Dr., Knoxville, Tenn.

KWM1 wanted. Also few high plate dissipation tubes 304T1, 4-100 etc., Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

NC-300, late model, in new condition, \$245.00, J. F. Bright, 131 Sycamore St., New Hyde Park, L. I., N. Y. Tel. 2-J008.

TRADE: Like new Communicator III (6M). For SSB equipment, exciter, VFO, etc. All offers considered. Harry Truelove, K5EOW, 711 So. 11th, Temple, Texas.

SELL: HQ-100C one year old, in excellent condition, \$150. Single Sideband exciter covers 75-20, 10 W P.E.P. built by W0BVQ, complete with power supply, \$70. F.o.b. my QTH. K0CCM, Mike Smith, 521 East Fifth, Hutchinson, Kansas.

TRANSFORMERS Custom-built, filament, modulation, plate. Also rewinding. Havill Manufacturing, 9007 Avalon Blvd., Los Angeles, Calif.

CALL Letters: Engraved on laminate phenolic. Black, mahogany, walnut, with white letters. 1 1/4 x 3 x 3/32, only \$1.00 P.P. Jaeger Products, P.O. Box 3674, Phoenix, Ariz.

MOVING: Must sell 60 ft. self-supporting steel tower 11 ft. square at base. Hy-Gain 3-element Triband beam. Prop pitch motor and position indicator Package deal, \$175 plus crating and shipping charges. Write for details. Larry Wiley, W0BLH, Camanche, Iowa.

KWM-1 and 516F-1 supply, mint, \$6.95. Gone "8" line. John E. Frizen, DL4EX, Ramstein AFB, Germany or APO 12, N. Y.

FOR Sale: Collins KWM-1, 12V-DC and 110V-AC supplies, mobile mounting tray and cable; Master Flex stainless steel heavy duty mount; three Mark heliwhip antennas — 10-15-20 meter; Shure Model 505 mike; only five months old, excellent condition. Will sell complete, \$1100. R. L. Terrell, 640 South Kensington, La Grange, Ill.

SELL: Excellent 75A-2 receiver, \$275; 60 ft. Donner heavy-duty crank-up tower, \$80; 3-element 20 meter, all aluminum beam, \$50; cash on all. John C. Parklison, W6KRC, 19626 Victory Blvd., Redwood, Calif.

FOR Sale: Johnson Facemaker, like new condx, \$295. Major H. W. Zirjaks, Signal Office, Ft. Polk, La.

HAMMARLUND HQ-110C, matching speaker. In original cartons, \$225. F. o. b. Allen Kier, 516 Bulburo Parkway, Syracuse 3, N. Y.

ELMAC AF-67 xmitr, Elmac PMR-6 revr, 8Ys Vibrat supply powers both. All 12 volt, \$200. H. Goodheart, W2KJQ, 3930 Anne Dr., Seaford, N. Y. Tel. SU 5-5755.

FOR Sale: S-38E, in ex. condx, 5 mos. old, \$42.00; QF1 in ex. condx, \$8. Raymond J. Norton, 25 Sierra St., Glens Falls, N. Y.

FOR Sale: RME 45 revr, general coverage, xtl filter, 8 meter. Just overhauled, new parts, tubes, calibrated, adjusted. Will ship, \$90. QF1 Q-X'er, not connected to revr, \$5. Steve, K7GQZ, 3332 N. 24 Place, Phoenix, Ariz.

FOR Sale: C.E. 600-L Amplifier, \$335; 75A4 (Ser. #4381) and matching speaker, \$525. Hallcrafters HT-32A, new, \$600. 310H-3, excellent, \$165. 10-B, \$458 V.F.O. #125. J. W. Craig, 62 N. Huntington, Peru, Ind.

Viking Challenger \$110 or best price. In A-1 condx; Heath VFO \$19; Heath SWR meter, \$16. All above in ex. condx. Going SSB. Dan Pierce, 1930 Ave. S, Kearney, Neb.

RECEIVERS: Hallcrafters SX-25, \$160; SX-100, \$200; BC-342 with Q multiplier and nat filter, \$65; tubes: 4 new 3041A, \$1.8 ea; 2 used 833A, KW triodes, \$20 each. Milen VHF exciter with 10M coils, \$15. George Nexus, K2OJU, 6 Fair Way, Penfield, N. Y.

FOR Sale: HQ-170 with matching speaker, three months old, perfect, \$300; brand new DX-100B, professionally assembled, beautiful performer, \$185. Reason for selling: hospital bills. Ed Dulaney, W4GMM, Box 255, Bishopville, S. C. Tel. Hunter 4-5432, 9 A.M. to 5 P.M.

BUILD with standard etched circuit boards, \$125. Complete layout catalog, 10¢. Willis McCormack Co., 15733 Sept St., Sepulveda, Calif.

KWM-1, AC supply, speaker, same as new, packed in original factory cartons. \$775. Lawrence Loughran, 430 San Bruno Ave., San Bruno, Calif.

FOR Sale: 75A-3 with matching speaker, \$395; Viking II, \$180. Both in mint condition. W9HOM, V. G. Carver.

NC-300, like new condx. First \$250 takes it. W1VRK, 28 Forest, Swampscott, Mass.

FOR Sale: Model G-6611 Gonset Mobile Receiver, complete w/power supply (speaker included), mounting brackets, factory manual and schematic diagram. Covers 10 through 160 meter amateur bands (phone, c.w., a.s.b.), also standard broadcast band. Operates on 6 or 12 volt mobile system or 117 volt a.c. line. (Will set up for either at buyer's request). Perfect condx, used very little. Will ship c.o.d. \$75. Only have the one receiver, first order received gets it. Henry A. Austin (K9HUR), 535 E. 33rd Place, Chicago, Ill.

SELL: NC98 clean, like new, 2 mtr. spkr, \$85; Johnson Adventurer, \$145; BC610 mod. mtrm, \$15. P6 and 6 mtr. xmitr with sockets. Pair new unboxed 4-65, 100W AM 6 and 2 mtr. xmitr, Milen RF. Write for dope. All F.O.B. subject to offers. Must ko. Need cash for expected Jr. Op. K4SCF, 1428 NW 102 St., Miami, Fla.

DX-35 and VF-1 unmodified and with manuals, new in operating condition and appearance. \$60. K6VRM, 5641 Dorset Way, Sacramento, Calif.

FOR Sale: Collins 310H, ex. condx, \$150; P.E.-103, new, \$15; Elmac 4-400A new, \$25 and RCA KW mod. transformer, \$15. W8UAS, 9829 Colwell, Allen Park, Mich.

ALUMINUM for every ham need. Write to Dieks, 62 Cherry Ave., Tiffin, Ohio for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

BC-348L with internal AC power supply, \$40, excellent condx. You pay the postage. Bob Ensminger, Rte. 1, Box J, Linden, Calif.

SX-28A, clean, 15 tubes, 2 RF stages, heavy-duty construx, genl. coverage revr, \$120 or best offer. K3NGMA, 5343 Wayne, Phila., 44, Penna.

COLLINS 75A4, like new, 3.1 and 0.8 kc filters, matching speaker, \$625; DX-100 \$150; WRL Triband beam with Radiant TR-2 rotator and indicator, \$80; microphone Electro-Voice Model 664, \$40. Wendell Thomas, 8424 Midland St., La Mesa, Calif.

SELL: Signal Generator, 1959 Heathkit LG-1, professionally wired. Calibrated against standard, \$50. W6JHN, Allen Olinger, 207 So. Ridgewood, Kentfield, Calif.

FOR Sale: Globe Chief, \$47.50; WRL VFO, \$40; WRL screen modulator, \$10; BC-348, \$60; Vibroplex Original deluxe bug, \$20; Electro-Voice 927 microphone, \$10. All goes for \$175. Dwight Garretson, 114 Lusk, Elk City, Okla.

AWARDS: DX, U.S. YL, over 250 are listed in the Directory of Certificates. Bill Clark, W3RPG, 8 Francis Dr., Harrisburg, Penna. HQ-160 with speaker, \$280, cash & carry. Used very little. Aramburo, 80-20 Broadway, Elmhurst 73, L. I. N. Y.

FOR Sale: Morrow Mobile Twins, MBR-5 revr and MB560 xmitr, both in mint condx, used very little. Only \$295. Also have Morrow MLX-5-12 motor driven variable inductor, \$16.50; PE-103 dyn. namotor, \$9.50; RVP-250 6 volt and cables, \$21.75 and home brew A.C. pwr supply w/cables. For above revr and xmitr, all Morrow parts were used except chassis. Cost over \$85.00. Will sacrifice at \$41. All items are scratch-free and in perf. opertg. condx. F. o. b. my QTH. Del Krause, K0MYI, Bentley, North Dakota.

FOR Sale: Viking Adventurer with home brew 30 watt modulator n v y aud condx \$30.00 takes all. 81 Zaval, 38 Hegeman Ave., Brooklyn 12, N. Y. Tel. DI 5-4693 after 6 P.M.

SELL: Globe Scout 680, \$80; Knight VFO, \$25; both one year old. NC-98 revr with xtl calibrator, Q multiplier and spkr. Bought new in January 1958, \$120. All equipt. like new. Roy Rosner, K2KRR, 843 E. 48th St., Brooklyn 3, N. Y.

COLLINS 75A3, Crystal calibrator, 800 and 3000 cycle mechanical filters, NBFM, adapter; immaculate. Building shielded, need the cash. Asking \$400 or your best offer. Contact Jack Connor, 7 Lewis Ct., Hingham, Mass.

HQ-160 for sale. Bought new Tuesday. Got overseas orders to nonham country on Friday. Hardly warmed up. Not even dusty. In original carton. First offer over \$300 before August 31. W4MXU, 281 California Hall, Ft. Meyer 8, Va.

FOR Sale: Viking completely TVT suppressed and shielded; Johnson VFO. Model 122; coax relay; dynamic mike; \$165 takes all. Local deal preferred. Ed Arnasz, W2WOD, 11 Acorn Drive, East Northport, L. I. N. Y.

FOR Sale: Excellent condition, 20A; brand new Band Hopper QT-1, 100 watt deluxe grounded grid linear with 2-1/4 34 tubes. First check for \$325 takes all. John Mansheim, W0JCS, Fort Madison, Iowa.

SELL: Harvey-Wells TBS-50 \$50, Morrow 30H-1, \$30; PE-103, \$10. Mallory Vibrapack VP554H, new, \$12; Central Electronics Mod. B slicer with AP-1, \$50; Central Electronics compression amplifier, \$30; BC-375 tuning units, new, \$5. Many parts, 28V relays. Tubes, Ken Maas, W9AZA, Burlington, Wis.

FOR Sale: Factory-built Viking Valiant, used only 40 hours. In like-new condx. Pleased with this rig, but am going mobile. Best offer over \$300 takes it. Terms are cash F. o. b. Idaho Falls, Idaho. James J. Coter, W7LEJ, 368 12th St.

FOR Sale: Viking Courier with spare pair of 811As, \$200. Lidico EE-3A Electronic Keyer, \$50. W9W3W

75A3, clean, has product detector, speaker, excellent SSB, \$375; 75A2, new condx, not a scratch anywhere, just like new, with spkr, \$350; RME DB-23, \$32; Instructionograph electric, 10 tapes, \$25. W9W3S, Kearney, Nebraska.

SELL: Globe Linear LA-1, \$95; PE103, \$15; Kresco 2-meter ground plane, \$4; new 4-125As, \$135, your offer. Harry Taubin, W2GCW, 731 Gerard Ave., Bronx 51, N. Y. N. Y.

WANTED: Gonset 2-mtr. linear, Reasonable. Richard Light, K2UOY, 640 Riverside Drive, N. Y. C., N. Y.

FOR Quick sale: Johnson Matchless antenna, new condx, \$75. K2HVB, 67 Meeting Lane, Hicksville, L. I., N. Y. Tel. Wells 5-9595.

HALLCRAFTERS SX-100, in ex. condx, \$180. Robert Padowicz, K2ULV, 16 Dale Drive, Chatham, N. J. Phone FR 7-0460.

IF You have a background in electronics, but are having trouble passing commercial FCC phone exams, my 12 years experience as chief instructor of electronics school can help you over the hump. Not a course. Write me personally for free information. Wallace Cook, 1614K Morrison Road, Jackson 9, Miss.

COLLINS KWS-1, like new, has less than 30 hours time, two extra 4X250-B, original shipping cartons. All for \$1200. Collins 75A-4, matches above xmitr, large spkr, 6 kc. mechanical filter, 3 kc. mech. filter, 2 kc. mech. filter. All like new, with original shipping cartons. Want \$500. Write M. B. Matthews, W5VAE, P. O. Box 1212, Batesville, Ark.

WISN station for sale during third week in August including BC-348, Tecmo xmitr, Mod. 78-4A, Mod. 78-4A, Mod. 78-4A, "ARC-5 type" 7 Mc rev. and trans. mounted on control panel; power supply; Smith, 210 Hill St., Bucyrus, Ohio.

FOR Sale: HT-32, \$500; SX-101, Mk 3, \$250. Both excellent. Must sell. J. E. Hurlt, Box 902, Ridgecrest, Calif.

FOR Sale: Collins 75A2 revr with 100 Kc bar, \$300; Milen 500 watt power amplifier, w/nd for 513 tubes, \$60; Milen 2000 30 watt exc. xlt, \$20; Meissner Deluxe sig. shfr, \$25; Parnet deluxe 66 in. vibrat cabinet, \$25; 2 new 8005 tubes, \$8.00, PE 104-A, 6-12 V. vibrat pwr supply, \$6.00. John Di Biasi, W2FX, 155 Bayview Rd., Plandome, N. Y.

MUST sell: Super selective LF amplifier for NC-300 as described in QST for Jan. 1957; parts for KW and power supply; many other items. Write for details. E. Getchel, Causeway St., Medfield, Mass. BC474A schematic wanted. W6SVM, Gassmann, 4915 E. Grant, Fresno, Calif.

CAN Offer in trade for 12 volt mobile rig: Kodak Retina 3.5 lens, leather case, value \$20; Volkhardt Reflex 3.5 lens, 4 filters, built-in synch., leather case, value \$50. G-E brand-new light meter, value, \$15. Prefer a local deal. Call HY 3-5773. Seymour Kaftan, 65 E. 52nd St., Brooklyn, N. Y. (sorry phone number error last ad)

RANGER, with push-to-talk kit, \$150; Johnson 672 xmitr, \$60; Johnson Adventurer \$55.00; Heathkit VFO, \$15; I&W Model 350B TR Switch \$15. K9AQV, 125 N. Bassford, La Grange, Ill.

FOR Sale: Globe King 400-C with 755-A VFO, \$300; AF-67 with a.c. power supply, \$125; Model B SSB slicer, \$50; 6V Paleo vibr. supply \$25V at 250 Ma., \$15. All units like new condx. K2HEX, Trenton, N. J. 1433 Liberty.

BEST Offer: National NC-173, SW-44; Heath DX-35, TC-2 tube tester, OL-1 oscilloscope, V7-A VTVM and HV probe, T-3 signal tracer, GD-1B and extra coils, SG-8 signal generator; SCPI CRT's; 2000/1750 V. DC at 500 Ma. pwr mtrm Stancor P9033, John Jamieson, WIJFK, Picketts Ridge Rd., Ridgely, Conn.

FOR Sale: HT32, perfect, \$575; Drake 1A 5 months old, \$265; 304TL G. G. linear and 3600V, 300 Ma. bridge power supply, \$135. Must sell all. W8LITZ, Frank Tefft, Alma, Mich.

SELL: DX-100, \$179; RME 4300, \$149 DX-71, \$125; all in excellent condx. Cash only. Lab Jelen, H. J. Medina, Ohio.

SELL: DX-100 for \$185 and SX-100 for \$210. Both in excellent like new condx. K6QXK, 1030 Oberlin, Glendale, Calif. CI 3-1425.

SELL: Complete operating mobile dream rig: Elmac AF-67, PMR-7, PSR-612, PE-103, mounting racks, 5-meter, relay box, antenna, loading coils, auto-trimmer inductor, spring mount, headset and hand mikes, 12 volt battery, all units plug-connected by cables. The first \$300 local pick-up, W2PQF, 188 Concord Drive, Paramus, N. J.

SELL: HQ-150 excite, condx, \$200; Will trade unused TR4 for Johnson Matchbox. Bill Rotunno, 1325 Mount Jackson Rd., New Castle, Penna.

WANTED: KWM-1 D.C. pwr. supp. type 516F-1-12. R. Yeager 1455 Wilson, Chicago 40, Ill.

FOR Sale: SX-101; Mark IIIA, brand new, in carton, \$340. Also HC10 SSB converter, new \$110. Harry Webb, 125 Ocean Ave., Jersey City 5, N. J. Phone HE 3-0803.

CW—Reliable station for sale: SC-100XA revr; well cared for, with good sensitivity, 0.5-30 Mcs. covers w/o limiter, 3 meter 250 cycle at 6 db xtal filter; \$55.00; 1.5sec 600-40-watt xmt; gud condx w/VFO, chirpless keying, bands 160-10, built-in low-pass filter; \$55.00. Both for \$95.00. All above F. H. Parker Swanson, K5GEM, Box 22454, Houston 27, Texas.

SELL: Latest model 75A3 with all-hand VFO, \$230; KC calibrator, speaker with light, mint condx, \$375; Hammarlund commercial model BE770-B, gud condx, w ps and instrux book, \$100; new BC459A, \$10. Want: HDV1 coil, W3KA, Ladd, 10406 Insley St., Silver Spring, Md.

SELL: Lakeshore Phasemaster II with all-hand VFO, \$230; SX-96, \$160; both in exe. condx. George Hall, K9AQM, 1717 Brookwood Drive, Gary, Ind.

DX-100 factory wired, perfect, \$185; SX-71, dual conversion, like new, new tubes, \$145; Matchless 125 SWR bridge with meter, \$10; WRL 10-meter beam, \$15. F. O. Topeka, Marvin Gikelson, WPERQ, 1220 West 31st St., Topeka, Kans.

SELL: NC-66 in like new condx without battery, \$65. Paul K. Damal, 24 Detroit St., Calumet City, Ill.

RANGER, new, very latest, factory wired, best offer over \$200; HO-140-X receiver, like new, w speaker, best offer over \$175. Bill Hein, K0JGF, RFD 2, Box 201, Loveland, Colorado.

SALE: HT-32 new December 1958, used less than five hours, \$550, c.o.b. Equ Gallie, Fla. Want: Mills 90672 antenna brace; QST and CQ binders, vintage of 1950-1955. Col. A. R. Marcy, 461-3rd Ave., Sea Park.

QSTs for sale: Dec. 1949; all 1950 and 1951; all 1952 less July and September; all 1953; all 1954 less Oct., plus extra Sept.; all 1955 1960 and 1957. Fine condx. Make offer. CQs for sale: May 1952; Nov. and Dec. 1953; all 1954, 1955, 1956, and 1957. Fine condx. Make offer. W4RQZ, 351 Del Mar, Melbourne, Fla.

NC-300, \$245; Globe King 400B, \$205; both in exe. condx. WIABJ, 40 Salisbury Rd., Brookline, Mass.

GONSET Owners! Rack for mounting Communicator I, II or III over transmission hump. Just the right position for convenient operation. No bolts or adjusters, in and out in seconds. \$4.95 paid shipping weight 4 lbs. Strid Electronics, 234 Washington St., North Easton, Mass.

FOR Sale: SX-99 with speaker, \$120; DX-35, \$45; CC-5-50 converter, \$30. W3KMU, 2719 Colston Dr., Chevy Chase 15, Md.

SELL: Globe Scout 65B factory-wired complete with six Novice tubes \$65; GPR-90 Communications receiver with 6 multiplier and xtal calibrator, \$385; SX-53 Hallcrafters receiver \$65; Eldico EJE-2 electronic key, \$28; two Sprinkled Enterprise 2M transceivers, \$15 the set; everything in perf. condx. Joe Holzman, 115 West 16th St., N. Y. C. Tel. AL 3-3958.

FOR Sale: Best offer: Never used. One Jennings vacuum variable capacitor, type UC5, capacity 9-375 ufd., 7500 volts. Ship via Railway Express only. W8RJP, 133 Brooklyn Ave., Youngstown 7 Ohio.

UNABLE to use here. Will sell for best offer: Collins KWS1 and 75A4 with both filters and vernier dial. Both used couple of months. Both just given factory modernization. Will be shipped direct from Coll's in factory cartons. W0HBB, 5311 Worthington Dr., Washington 16, D. C.

MUST sell W0RNE: DX-35, Viking VFO, NC-98, DB-23, Heath balance; new BC4X150As, Write Ken Newman FT2, C.S.S. Healthveston CLG-3, FPO New York, N. Y.

SELL OR trade: Teleplex with oscillator, instructograph adapter, mounted in cabinet, plenty of practice tapes, \$29. Teleplex also perforates tapes. W8FGS, 110 Fayette, Charleston 2, W. Va.

FOR Sale: Portable mill, \$20; Garrard record-changer, G-E cartridge, \$15; Log detrectr slide rule, \$15; Zenith portable radio, \$15; hearing aid, \$10; 2-station intercom, \$10; Astelle AT-1 TV booster, \$5. Radio and electronic books. Send for list. V. R. Hein, 418 Gregory Rockford, Ill.

VALIANT, factory-wired, must see to appreciate, \$300; Telrex 20M-56-112, 3-d. beam, like new, \$85; Pr. Elmac 304T1S \$20. Shure mod, 795-A xtal mike with stand, \$10. No junk! Don Phillips, W3LTI, 49 E. Grandview Ave., Sellersville, Penna.

SELL: 20-A, perfect electrically and physically. Complete with QT-1; BC-458A VFO and instruction manual, \$250. Works perfectly. Will ship. If you don't like this proposition, make your own offer! Also have DX-40, complete with instruction manual and diagrams and VF-1 VFO. Not quite one year old. Want \$80. Will ship. Heathkit SWR meter, \$12. Both for \$89. Knight Ocean Hopper, 87 P.P. Seid Jones, K0GTC, Seneca, Nebraska.

TAPETONE 6 meter converter model XC-50K; LF 26-30 Mc with power supply, \$45; Heathkit grid dipper, \$12. Donald Hornbeck, 50 Seventh Ave., Lowell, Mass.

SWAP: Telescope, 6 inch reflector, 54 in. F.L., f9, 1/4 accuracy, Springfield type mounting, setting circles, knob controls, rack focus eyepieces; Ernie wide angle 72X, Ramsden 160 X. Concrete pedestal free if you use it. It is a bargain. Needs handman or perfect finer points. No shipping. Swap for C.E. 20A or equivalent exciter or commercial 400 to 500 watt linear amplifier with power supply. K2ZCC.

VIKING Courier, factory wired, like new, \$210 or best offer. Also, Gonset Commander and VFO, \$100 or best offer. W3GXM, 1006 Kinross Ave., Silver Spring, Md.

JOHNSON Viking II with VFO, 2 microphones, balun coils, key, \$175; Estate of W3VMT, Phone WAU, 5-7532 or write to Mrs. J. M. Robertson, Box 4, Hunkers, Penna.

B&W 5100-B, \$325; SX-100 R46B, \$200; T-90 AP850 AC supply, \$150; Heathkit MP-1 transistor supply, \$35. All in excellent condx. WIPNM, Glen Cove, Maine.

HAMS! Learn calculus, powerful modern mathematics. Easy practical lessons, first four \$1. Mathco, 4296-22 Minmor, Cincinnati 17, Ohio.

INCOMPLETE file of QSTs from 1920 to 1952, 261 issues. Best offer. Stamp for list. New 5527 tube, \$50. Ray Frank, W5JU, 7703 Morrow Rd., N. E., Albuquerque, N. Mex.

S-85, Hallcrafters 8-meter installed, QF-1; \$95 or best NYC area offer. Stan, K21RS, WY 1-4710.

CHICAGO Area sellout, featuring HRO-50-T1 w/ accessories, Viking II plus VFO and filter, 1000-watt complete w/ht tubes, meters, power supply and exciter. Type V relay, p. -103, RG-1 cable, hundreds of parts. C. Heath, 125 E. 4th, Hinsdale, Ill. 3-1512.

HQ129X, Late model perfect, Inc. Spkr. \$129.50, F.O.B. Gil Severns, Hemet, Calif.

SFLL NC-183D, w/spkr \$239; HQ100C, \$139; tubes and other parts for sale or trade. BC455 unmodified, excellent, \$9.95, Stamp for list. M. Marshall, 455 Washington Ave., Dumont, N. J.

MOBILE or portable station for sale: Gonset 77A transmitter for 6 or 12 volts DC or 110 volts AC, \$189; Elmac PMR receiver with 6 and 12 volt supply, \$85; Elmac PSR 117 110 volt AC receiver, power supply and 8 meter, \$10; share 505B Ranger MkII, \$0; 40M and 15M Helwigh, \$14; Instructograph and tapes, \$12. S. Ross, W91SY, 1844 N. Rutherford, Chicago, Ill. Berkshire 7-1082.

6 Volt Alternator, comp. w rectifiers, regulator, wiring, & wiring info \$35, 12 Volt Motorola 147.3 Mc. FM mobile; FMTU 30D xmt, FMU 250V, 6Vt plus 4A accessories. Excellent mechanically and clean. Meets electrical specifications. \$125. Also have Motorola 30D and 16V mounted in foot locker, excellent portable or base for 110 VAC, \$60. W9GHIK.

SELL: Surplus scope, needs vert. control. Gud BC-348, no p/s. No time to fix, make an offer. Tll ship. Kent, K4ESX, Dozier, Ala.

FOR Sale: Hallcrafters SX101 Mark III revr, new matching spkr, \$295; Hallcrafters HT-32, SSB, DSB, AM xmt with coax ant. relay, \$540. All equipment: original containers, in exe. condx. Shipping costs paid anywhere U. S. A. Write Charles E. Craig, W0V0H, 980 1/2 St., Boulder, Colorado. Cash deal only!

WANTED: 6 to 12 304TL tubes, Callanan, W9AU, P. O. Box 155, Barrington, Ill.

FOR Sale: 1 pair BC-611 handle-talkies (3885 Kc) complete with batteries and manual. Very gud condx. Will ship. Best offer. Dave Mueller, W5LBD, 10 Alcott Lane, Cincinnati 15, Ohio. Phone Jackson 1-5334.

COLLEGE Bound! Need cash. NC-125 w/spkr; 75 watt c.w. xmt (QST Jan. '57), exceptionally clean, no reasonable offer refused. Bob Syversen, K2UTW, Willow, Utah, Co., N. Y.

FOR Sale: Best offer, 75A4, Serial #108, Viking Viking Valiant, both in superb condition. K9GXB.

FOR Sale: Collins 75A-2A, 3 Kc mech. filter, \$325; B&W 5100-B with 515B-B filter, \$175. Both in exe. condx. Both in exe. condx. First check takes them. Al Stancel, W4PHY, 1411 N. 7th Ave., Lanett, Ala.

WANTED: 2 pair, surplus chamois skin covered headphones for speech and hearing therapy classes.

CRYSTALS Airmailed: mobile, Net, SSB, Commercial, etc., Chicago 0057, all elements, overtones, FT-243, \$2.50; HC-6U hermetics, \$2.95; all Marine frequencies 0057, \$1.95. "SSB Package" per June 1958 QST and SSB Manual, mixer sets FT-243, \$8.95; HC-6U hermetics, \$11.95. Matched filter sets \$6.90. FT-243 any kilocycle 017, \$5.00 to \$6.00, \$1.49; Novice 998 Airmailing 94 per crystal. Crystals? Ask us, we have them all. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

TUBES: Brand New, Guaranteed, 4-65A \$13.50, 4-125A \$29.50, 4-250A \$39.50, 4-400A \$49.50, 4X250B \$32.00, 4132 \$22.50, 100TH \$8.50, 50TH \$17.50, 41 for \$8.50, 802 \$6.50, 802 \$3.50, 809 \$3.75, 810 \$12.50, 811 \$3.50, 811A \$6.50, 813 \$8.50, 814 \$3, 829B \$6.50, 832A \$5.50, 833A \$5.50, 866A \$1.50, 872A \$1.50, 6146 \$4.00, 2E26 \$3.85, 3BP1 \$3.75, 5BP1 \$4.95, 4E27 \$6.50, 701A \$4.75, 72-40 \$12.50, BC-221 Frequency Meter, like new \$65, Command Receivers 190-550ke \$12, 6.9 line \$8, Tuning Knobs \$1, Command Transmitters 3-4mc, 5.3-7mc \$6.50 each, 7-9.1, PE-109 Dynamotor with Folter Base, Cables, excellent, \$25, Bill Slep Company, Box 178, Ellettsville, Ind.

FOR Sale: Brand new RCA 4-250A in carton, \$28.00. H. Webb, 125 Ocean Ave., Jersey City, N. J. Phone HE 3-0803.

SX101 Mark III, almost new, \$285; mobile transmitter, Gonset Commander with VFO, dynamotor, ant. relay, power relay, cables, etc. \$90 complete. M. D. Haines, W5QCB, 1316 S.W. Military Dr., San Antonio 21, Texas.

PE-103 Dynamotor, 6-12V inp. 500V out, \$12; ARC-4 with 12V dynamotor, \$18; Bud xtal calibr., \$12; new 301 Weston panel meters, \$6.50; DC millivolt multivolt meter, \$50; pair Elmac 100TH \$8.00 each; 8020, \$8.50; 826, \$7.50; 832A, \$7.50; 1625, \$16.25, \$1.25, \$1.25, \$2.00; 813, \$8.50; 5FP7, \$8.50; 5CP1, \$9.50. New 661, make offer. Send for complete list. C. Williams, WA2CL, Clinton Rd., Hewitt, N. J.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P St., Livermore, Calif. W6KFX, skipper.

FOR Sale: Morrow Conrad model, \$20; 30 ft. Beiden #8410 with connectors, \$2; Calrad model 500C omnidirectional mike with stand, \$6.00; 45 rpm RCA phonograph, \$10; more than 100 new and old 45 rpm records, \$5; 45 rpm record box that holds 80 records, \$3; 20 ft. Beiden #8401 mile cable \$1.00; Van de Graff electrostatic generator, \$10; KSJLF, Rt 4, Box 517, San Benito, Texas.

NEED use old eqpt. to get on air. Rite to G. Hodo, Gilbertown, Ala. Tex.

COLLINS 758-1 and Gonset GSB-100 for sale. W0UVV, R. Goette 643 Colebrook, Webster Groves 19, Mo.

SELL: Heath AR-3, \$27; QF-1, \$8; VF-1, \$17; AC-1, \$10; AT-1 with 6146 filter and 160 meter band, \$28. All for \$85. You pay shipping K5UDK, 2550 Oberlin, Lorain, Ohio.

SELL: HT-33A, two months old, in A-1 condx, \$695. Will deliver up to within 200 miles. W8MHJ, U. S. 41 at summit. Hancock, Mich. Ph 81.

FOR Sale: SX-101 Mark III, \$295 or best offer, shipping free. Write RR 1, Box 148, New Augusta, Ind.

FOR Sale: S-85 revr. In exe. condx. Best offer over \$80. Call or write K2ZSY, Ronald schulte, 3013 Valentine Ave., Bronx 58, N. Y. C. tel. SE 3-6152.

FOR Sale: Viking Challenger, WRL 755A VFO and 6 meter VFO in exc. condx, \$180. KIDRX, 42 Brookville Rd., Bedford, Mass.

FOR Sale: Heavy duty microwave tower, never used, consisting of 13 10 ft. sections, hardware, mounting brackets, etc. Dzula, W2OJC, 54 Charles St., Clifton, N. J. PRescott, 9-0639.

SELL: Milen 500 watt final: use as linear, complete with tubes, 80, 40 meter coils, \$65.00; Central Electronics 10-A exciter, anti-rip, 80, 20 coils, \$80; Electro-Voice d10 xtal mike and stand, \$8.00; Complete set components for 1/2 KW supply, \$30; home brew 80 meter 150 watt linear, \$20; Bud 39 in. rack, \$15; 100 Kc xtal, \$3.00; two 61A6s, \$4. All plus postage. J. Morgan, K9HCX, 3621 Newark St., N.W., Apt. 101, Washington, D. C.

CASH or trade for used equipment: Treger, W9IVJ, Tuxedo, 9-6429, 2023 N. Harlem Ave., Chicago 35, Ill.

PENNSYLVANIA — The 22nd annual Hamfest of the South Hills Brass Foundry & Modulators will be held Sunday, August 2, at the Museum Building in the South Park Fair Grounds. There will be activities for young and old. Swan and Shop. Pre-registration is \$1.50, \$2.00 at the door. Contact Mr. Harry Ridenour, K3HHX, 619 Lindsay Rd., Carnegie, Penna.

WANTED: Sylvania Counter tubes (6476), Bob Wilson, W8JRN, 1925 Parkhill Drive, Dayton 6, Ohio.

SELLING Out: KWM-I serial 1087 516F-I supply, JF-30 mike, Vibroplex Lightning bug, all purchased new and used only a few hours. Offers wanted. K6VJE, 10234 Vista La Cruz, La Mesa, Calif.

KWM-I Serial number 337 with AC power supply, \$695 F.o.b., Shreveport, La., by Louis M. Gregory, W5FLZ, 3025 Old Mooringsport Rd.

MAGNETIC Tape at bargain-basement prices: Acetate base: 600 ft. 5" reel, 3 for \$2.45; 900 ft., 5" reel, 3 for \$3.40; 1201A: Heathkit 3 for \$3.95; 1800 ft., 7" reel, 3 for \$5.25; Mylar base: 900 ft. 5" reel, 3 for \$4.20; 1800 ft., 7" reel, 3 for \$6.85; 2400 ft., 7" reel, 3 for \$10.60. Guaranteed top quality, 30-15000 CPS. Satisfaction or money refunded. Add 1¢ cents per reel PP handling. Florman & Babb, Inc., 68Q West 45th St., New York 36, N. Y.

SELL: GPR-90 revr & spkr. Super Six mobile converter, Johnson mobile xmt. Gordon Lauder, W9PYD, 134 Marquette St., Park Forest, Ill.

SELL: DX-40, \$60; Knight VFO, \$30. Ralph Pincus, WA2AWH, 1263 Grant Ave., Bronx 36, N. Y.

REGENCY ATC-1 converter, \$55; Hallcrafters S-106 6-meter revr, \$45. B. J. Keyes, Mexico, Ind.

GONSET III, 6 meter Communicator, used 3 hours only; in original carton for shipment, \$195. A. S. Lawrence, 53-09 97th Pl., Corona, N. Y.

WANTED: SX-28 Hallcrafters Model, George F. Baptiste, 100 Waltham St., Boston 18, Mass., Tel. HA 6-0430.

THUNDERBOLT with attenuator for \$425; Gonset Super Six with B noise clipper, \$30; 6 volt 100 amp. alternator, complete, \$30; 2500 volt 1 amp. power supply components. Terms. Need: 2 meter Gonset. K9CAZ, Bunker Hill, Ill.

BEST Offer: Station of W8TC-K, deceased, NC-300 w/spkr; Viking II w/Mod. 122 VFO; D-104 mike on pt. stand, HC-221A-A; Heathkit SWR bridge, Mod. AM2, Simpson 2600 multimeter; B&W #600 GDO; Precision EV-20 VTVM and RF probe; Trimm 2000 Ohm phones; BTU-2 UHF converter; new 8" PM spkr. Prefer sale in or near vicinity (jack cartons for shipping). Mrs. Robert Besser, 507 Walker, Sturgis, Mich.

SALE: Collins KWS-1 and 75A-1; both in perfect condx. O. J. Mills W6CYL, 11669 McDonald St., Culver City, Calif. Phone EXmont 7-5981.

FOR Sale: Collins 75A4 with 3.1 Kc filter and speaker. In perfect condx. like new, \$255. J. L. Gammill, Box 253, Patuxent River, Md. Phone Great Mills 15434.

FOR Sale: New Gonset G43 receiver, bought from WRL May 1959, Cost \$160. Never used. First money order for \$85 takes it. Bob Randall, Ashland, Kansas, W9NRN.

PANDAPTER Mod. PCA2. Sell for forty-five dollars. WAYM, 406 Bon Air, Tampa 10, Fla.

FOR Sale: Hallcrafters SX28, needs work in RF section, \$40, good condition otherwise. Worth over \$100 on trade-in. Call Charlie, W2KNG, 68-16th Ave., Paterson, N. J. Phone LA 3-1250 between 5 & 7 PM or write.

SWAP W2EWL special SSB 75M-20M exciter with 800v. power supply and breadboard VOX and AT for good tape recorder. W5BYK, P.O. Box 262, Batesville, Miss.

FOR Sale: NC-100, no speaker, \$35; Lettine Mod. 240, \$50. Both in gud condx. Local deal only and Eldico xmt., \$20. K2BDD, 2245-64th St., Brooklyn 4, N. Y.

WANTED: RME VHF-152. Ken Goodwin, Best View, Quaker Hill, Conn.

SALE: Viking II, push-to-talk DK1 mike and stand; VFO, Matchbox and low-pass filter. Gud condx, \$280. NC-300, 2-RF converter, xtal cabl. spkr, \$300. Henry Sherman, 1535 Barnack Blvd., Pt. Pleasant, N. J. Tel. TW 2-2862.

WANTED: Technical manuals and tube test data bulletins for use with tube tester I-177-B and adapter, MN-949-U. KN8NSJ, J. Williams, 19771 Upper Terrace, Euclid 17, Ohio.

RCA AR85LE, in exc. condx, \$225; Viking I VFO, push-to-talk, \$100. K2HJB, 188 Davey St., Bloomfield, N. J. Pilgrim 3-9082. Firm.

COLLINS 75A4, in exc. condx. Brand no appearance: \$590; Hammarlund HQ-170, brand new, in factory carton, with spkr, \$325. H. J. Curry, K9EWX, 3015 8th Ave., Kearney, Nebraska.

SELL Used S-53-A receiver, like new, recently overhauled. First offer over \$55 takes it. Great for beginners! Canizares, 210 Grandview, Yonkers, N. Y.

FOR Sale: KW linear with two 4-250As, \$125, 500 watt audio with 500 ohm input, \$60; Johnson Navigator, exc. condx, \$130; Heathkit hi-fi WA-P2 preamp and W-5M 25 watt amplifier, \$60; misc. transformers. Heathkit AR-3 and Q multiplier, \$35.00. Send for list giving full details on the above and other items for sale. William Madigan, W1UGF, 159 Nott St., Wethersfield, Conn.

SX-71, less speaker, \$150; Super-Pro power supply, \$25. Meissner signal shifter, \$20. Kilowatt components. Write for list. W8JHH, 270 North Olive, Elyria, Ohio.

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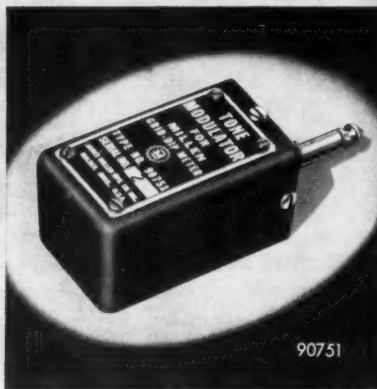
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Designed for



Application



90751

TONE MODULATOR FOR GRID DIP METER

The Millen "Designed For Application" No. 90751 Tone Modulator is a small package, containing a transistor audio oscillator and its mercury battery, which plugs into the 'phone jack of a Grid Dip Meter to modulate the signal at approximately 800 cycles for applications requiring a modulated signal. Modulator is automatically turned on when plugged into a Grid Dip Meter jack.

In addition to its prime use in modulating a Grid Dip Meter, the No. 90751 may be used in other ways. The Tone Modulator has sufficient power output to drive a pair of headphones without amplification. Therefore it may be keyed for code practice or it may be plugged into the mike jack of a 'phone transmitter to provide a tone for modulation checks and for modulated C.W. emission.

Dimensions: only 4 x 1 1/4 x 1 1/4 in.
Weight: 4 1/4 oz.

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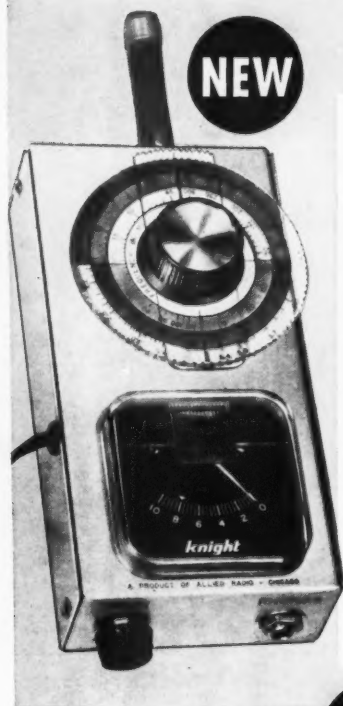
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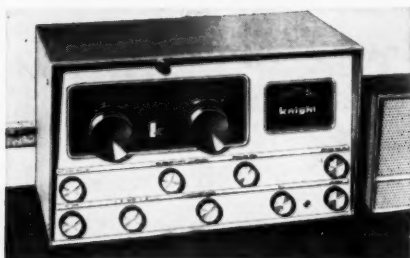
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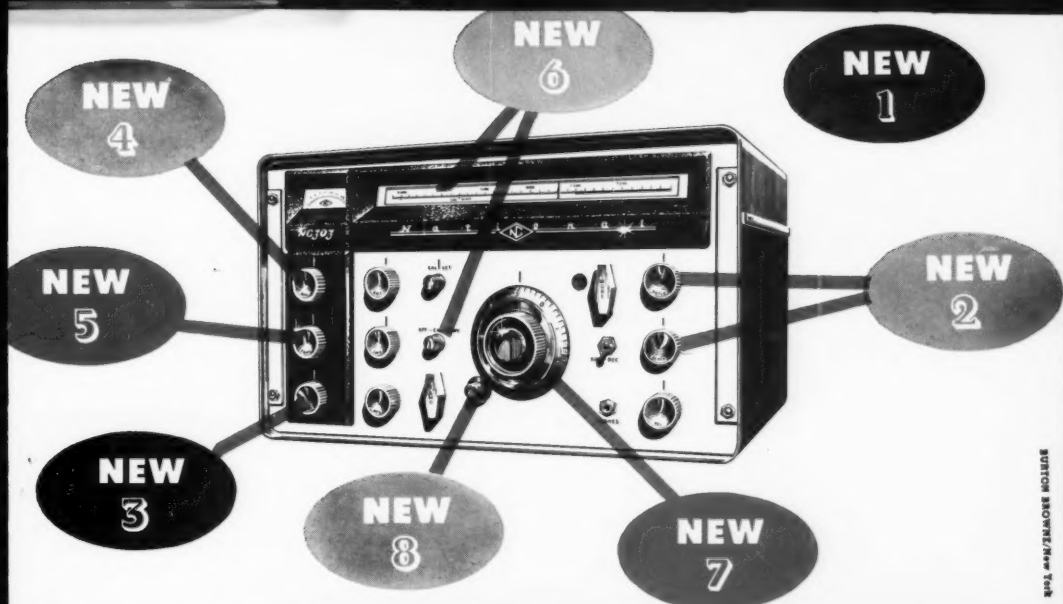
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